INSTRUCTION MANUAL
MODEL 117

MP MASTER
MA23373

Magnetic AB
Manufacturing Division

STOCKHOLM — BROMMA — SWEDEN

IMEX. MARKETING FACILITIES

FOX OAK

SEVEN HILLS ROAD

WALTON-ON-THAMES

WEYBRIDGE. 44896.

PRELIMINARY

INSTRUCTION MANUAL

FOR

NOISE FIGURE METER

model 117

MAGNETIC AB
Stockholm - Sweden

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1. INTRODUCTION

1.1 General description

Precision Noise Figure Meter model 117, with an appropriate noise source, automatically and continuously displays the noise figure of the receiver to which it is attached. The noise figure of a receiver is a measure of its sensitivity; the lower the noise figure the better the sensitivity.

Model 117 is designed for receivers having intermediate frequencies between 5-140 MHz (Different Plug-in Amplifiers It may also be used with devices tuned to other frequencies if a converter is used to obtain the frequencies mentioned above.

The noise figure meter provides a convenient and simple method of measuring and optimizing the noise figure of a receiver or amplifier.

1.2 Noise Sources

MAGNETIC AB manufactures two types of noise scurces, which can be used with Noise Figure Meter model 117. The noise figure meter supplies these sources with suitable voltages and currents.

1.2.1 NOISE SOURCE model 121

Each noise source consists of a length of waveguide in which is mounted gas-discharge noise tube. Accurate measurements are assured, since careful design has made the VSWR low. These sources are available in S, G, J, H, X, P and K-bands or 2.6 to 26.7 GHz.

1.2.2 NOISE SOURCE model 122C

This noise source consists of a helical transmission line with a gas discharge tube mounted inside. The impedance is 50 ohm and it can be used in the frequency range 250 to 4000 MHz.

1.2.3 NOISE SOURCE model 123

This noise source contains a temperature-limited diode. The generator impedance is 50 ohm and it can be used in the frequency range 5 to 250 MHz. This source is also available with higher impedances.

2. OPERATING INSTRUCTIONS

2.1 Introduction

This section tells how to perform noise figure measurements on receivers and amplifiers.

2.2 Controls and Connectors on Panel

2.2.1 METER FUNCTION SWITCH

This is a push button control with eight push buttons, one for each range. These are: 0-15 dB, 3-18 dB, 6-21 dB, 9-24 dB, 15-30 dB, SET ∞, CURRENT 4 mA and CURRENT 12 mA. Position SET ∞ (with its screwdriver control) is used to calibrate the meter before measurement. 0-15, 3-18, 6-21, 9-24 and 15-30 dB are used when the noise figure is to be read on the meter. A range can almost always be chosen so that the meter can be operated in the upper half of the scale deflection. Positions CURRENT 4mA and CURRENT 12 mA are used for setting up the noise sources.

2.2.2 NOISE SOURCE

This is a push button control consisting of three buttons. One for GAS TUBE ON, one for OFF and one for DIODE ON.

2.2.3 CURRENT

The noise figure meter has two current controls. One for noise sources with gas-discharge tubes called CURRENT x 100 and one for diode noise sources labeled CURRENT x 1.

2.2.4 EXCESS NOISE COMPENSATOR

This digital switch is used to set the excess noise of the noise source being used (gas discharge tube sources only). The scale of the noise figure meter then reads noise figure without any mental corrections. A light to the left of the digital switch warns the operator if he has adjusted it outside its range.

2.2.5 INPUT

Connect to output of equipment being measured. Switch above INPUT connector is an input attenuator to aid the AGC system in the noise figure meter. Depending on the level of the input signal, the appropriate range of the two, 20 uV - 5 mV/2 mV - 0.1 V, should be chosen. The AGC system operates over the full range 20 uV to 0.1 V, but the attenuator is used to reach the ultimate in accuracy.

A light to the right of the plug-in units warns the operator when the signal is too low.

2.3 Controls and Connectors on the back

All other connectors have, for the convenience of the operator, been placed at the back of the instrument.

2.3.1 PRF control

This control adjusts the PRF of the master multivibrator. Set the control to any convenient position to eliminate beat effects in the over-all system; such as power line harmonics. Such effects are usually noticable as wide excursions of the meter pointer. This control does not in any way effect the basic accuracy of the 117.

2.3.2 MANUAL GAIN Control

This control adjusts the gain of the amplifier, when the noise figure meter is used for manual measurements or as an indicator. The range of this control is approximately 60 dB.

2.3.3 AUTO-MANUAL Switch

This switch is used to select the automatic or manual mode of operation.

2.3.4 GAS TUBE connector

A noise source with a gas-discharge tube shall be connected to this connector. NOTE - this is a MHV connector and not a BNC. If the GAS TUBE push button is pushed, with no source connected, a high voltage spike will be developed across the connector. This will not damage the equipment, but can be dangerous to the operator if he is trying to touch the center conductor.

2.3.5 6.3 V 0.8 A (GAS TUBE)

Heater voltage for noise sources requiring a heater supply. The heater supply is floating. Ground return is available on one of the pins in the connector.

2.3.6 DIODE connector

Thermionic-Diode Noise Sources shall be connected to this connector, which is a MS-3102A-14s-5s connector.

2.3.7 VIDEO

The video signal in the instrument is available for observations in this connector. During measurement of noise figure this signal is a wave form where every second pulse is lower in amplitude than the rest.

When the noise figure is infinite the amplitudes are equal. There should be a smooth noise on the tops of the pulses. Any interference signals in the system will show up here. The small signal has an amplitude of about 100 mV.

2.3.8 RECORDER (Remote meter)

A DC voltage proportional to the panel meter deflection is available for recorder or remote meter operation. Full scale is approximately 4 V (R_i = 4 kohm).

2.3.9 MVB

Wave form for driving a maintenance calibrator unit is available from this connector.

2.4 Operation

2.4.1 AUTOMATIC MEASUREMENT OF NOISE FIGURE USING A GAS DISCHARGE NOISE GENERATOR

1. Connect equipment as shown in fig. 2.1 and connect to the receiver where the signal level is between 20 uV and 0.1 V. Select the correct input frequency and if necessary change plug-in amplifier.

2. Connect source to GAS TUBE connector.

3. Set meter function switch to "Current 4mA".

4. Push NOISE SOURCE to GAS TUBE.

5. Adjust current to the following value: (or the value shown in the noise source instruction book):

Model	Current
S121	200 mA
G, J, H, X, P and K121	175 mA
122A	100 mA
122C	175 mA

6. Push to SET ∞ and set meter to ∞ (infinity).

7. Set meter function switch to any of the NOISE FIGURE ranges and read noise figure on the [illegible].

2.4.2 AUTOMATIC MEASUREMENT OF NOISE FIGURE USING A THERMIONIC-DIODE NOISE GENERATOR

1. Connect equipment as shown in fig. 2.2 and connect to the receiver where the level is between 20 uV and 0.1 V. Select the correct input and if necessary change plug-in amplifier.

2. Connect noise source to DIODE connector.

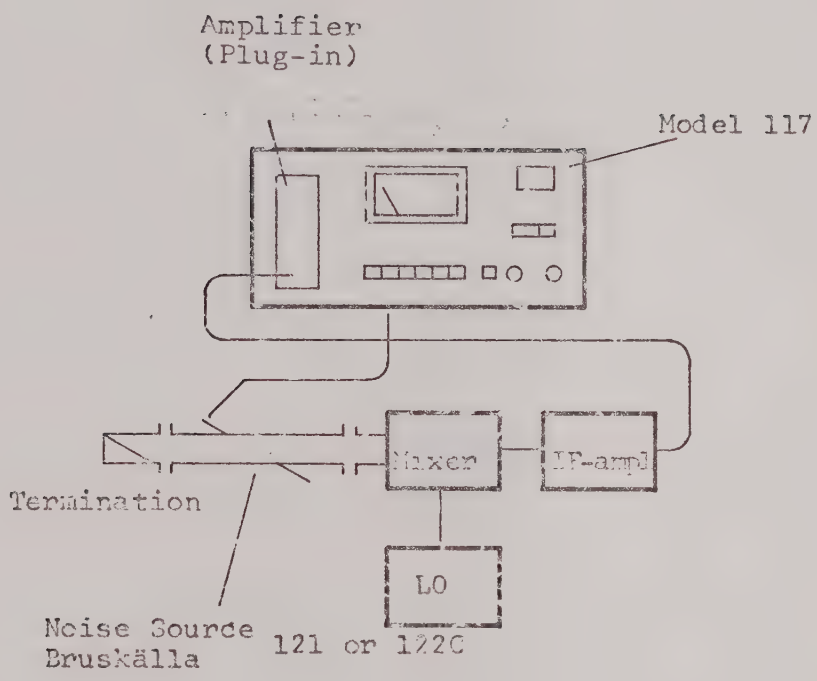


Fig. 2.1

Set up for Automatic Measurement using a Gas Discharge Noise Source.

Mätuppkoppling för automatisk mätning av brusfaktor. Brusgenerator med gasurladdningsrör.

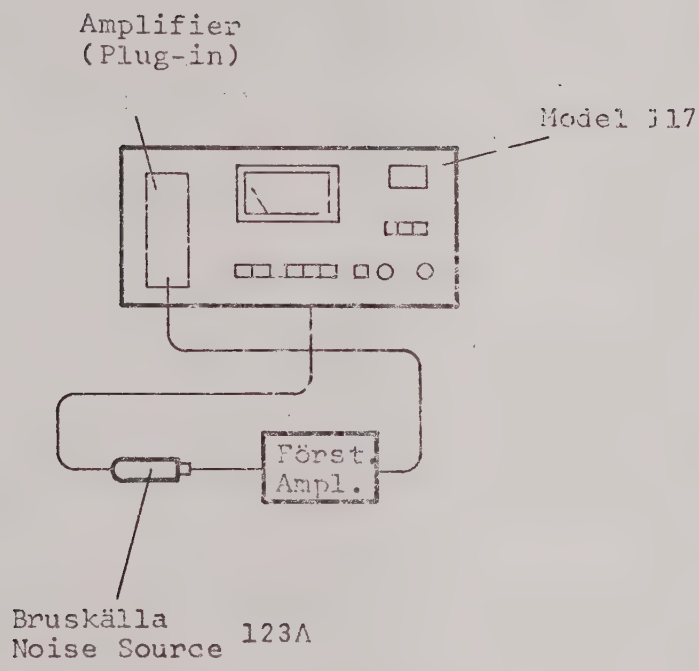


Fig. 2.2

Set up for Automatic Measurement using a Temperature Limited Diode Noise Source.

Mätuppkoppling för automatisk mätning av brusfaktor. Brusgenerator med temperaturbegränsad diod.

3. Set meter function switch to appropriate current scale.

4. Push NOISE SOURCE to DIODE.

5. Adjust current to the following value:

Model	Current
123A	7.08 mA

or

$$I = \frac{50 \times 7.08}{R}$$

where R = source impedance

6. Push to SET ∞ and set meter to ∞ (inf.).

7. Set meter function switch to any of the NOISE FIGURE ranges, except the 15-30 dB range, and read noise figure

2.4.3 RECORDER (External indicator) SCALE CALIBRATION

Calibration is very simple to perform. The infinity (∞) point is set using normal calibration procedure. The full scale deflection (0 dB) is set by switching the AUTO-MAN switch to MAN and connecting a signal to the AMPLIFIER input. The full scale deflection is now set by the MANUAL GAIN control at any noise figure range. This gives the two calibration points, infinity and full scale deflection (0, 3, 6, 9 and 15 dB), for an external indicator.

The following equation is used to calibrate the recorder or an external meter scale.

$$\text{Deflection} = \frac{100}{\text{Antilog } \frac{F-A}{10}} \quad \text{per cent}$$

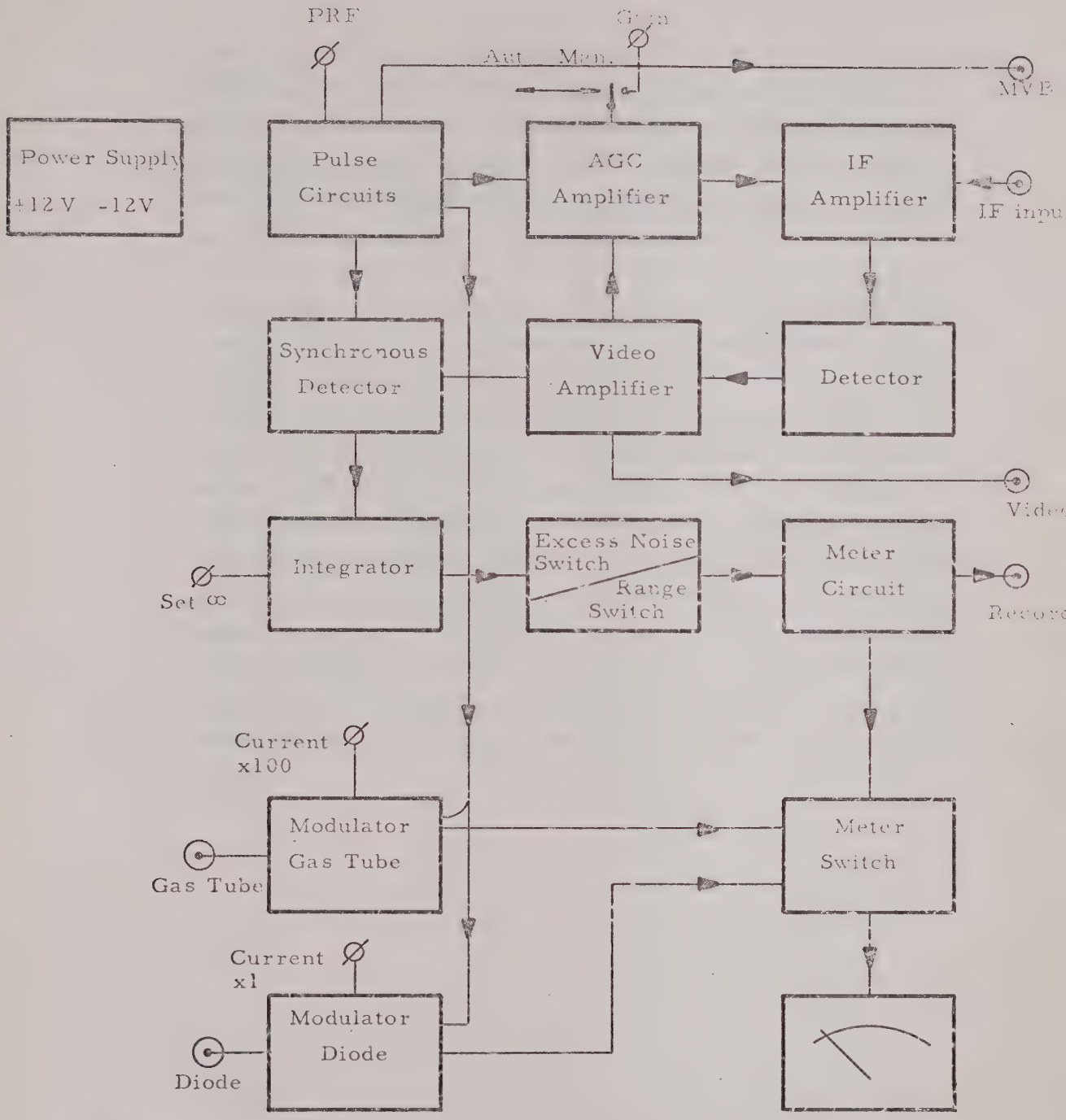
where A is equal to 0, 3, 6, 9 or 15 dB depending on range used.

3. PRINCIPLES OF OPERATION

To make noise figure measurements, the model 117 Noise Figure Meter, the appropriate noise source and the device under test are connected as shown in the block diagram. The Noise Figure Meter square wave modulates the noise source at about a 330 Hz rate and measures noise figure by comparing the noise output of the device under test when the noise source is off, with the noise output when the noise source is on.

The input circuitry of the model 117 consists of a gated tuned amplifier, which operates at frequencies selected by a front panel switch. The output from the amplifier is applied to two integrators which are gated alternately at about 330 Hz, the same rate at which the noise source is turned on and off. When the noise source is off the power from the device under test is amplified by the amplifier and integrated by the AGC integrator. The time constant of the AGC voltage, applied to the amplifier, is long enough to hold the gain of the amplifier the same whether the noise source is on or off.

When the noise source is turned on, the combined noise power from the source and the device under test is amplified by the tuned amplifier, integrated and displayed on the meter. Because of the AGC action, the meter deflection is proportional to the difference of the noise powers (source on and source off) and since the additional noise from the noise source (excess noise) is accurately known, the meter face is calibrated directly in dB of noise figure.



BLOCK DIAGRAM
MODEL 117

The AGC action, in addition to establishing a reference, provides a wide (50 dB) dynamic range and also eliminates the necessity for periodic resetting. The meter face is provided with one noise figure scale, which can be expanded so that a reading can always be made on the upper half of the meter scale.

Scales are also provided to indicate the current supplied to the noise sources and thus facilitate the initial set-up of the source. A coax jack is provided on the rear to drive a remote meter or recorder, so that a permanent record of noise figure can be made, or so that a plot of noise figure versus frequency can be made of broad band receivers. Although designed for fast, accurate, automatic noise figure measurements, this Noise Figure Meter can also be used for manual measurements. A switch in the instrument converts it to an accurate square law indicator. The noise source may then be switched on or off as desired, the noise ratio noted. From this the noise figure can be calculated.

4. LIST OF FIGURES

Noise Figure Meter model 117

Wiring Diagram	E-117000

Power Supply

Circuit Diagram	E-117001
Component Layout	E-117015

Pulse Unit

Circuit Diagram	E-117002
Component Layout	E-117017

AGC and Measurement Unit

Circuit Diagram	E-117003
Component Layout	E-117019

Meter and Switch Unit

Circuit Diagram	E-117004
Component Layout	E-117021

Excess Noise Switch

Circuit Diagram	E-117010
Component Layout	E-117103

Modulator model 1175 (Gas Tube)

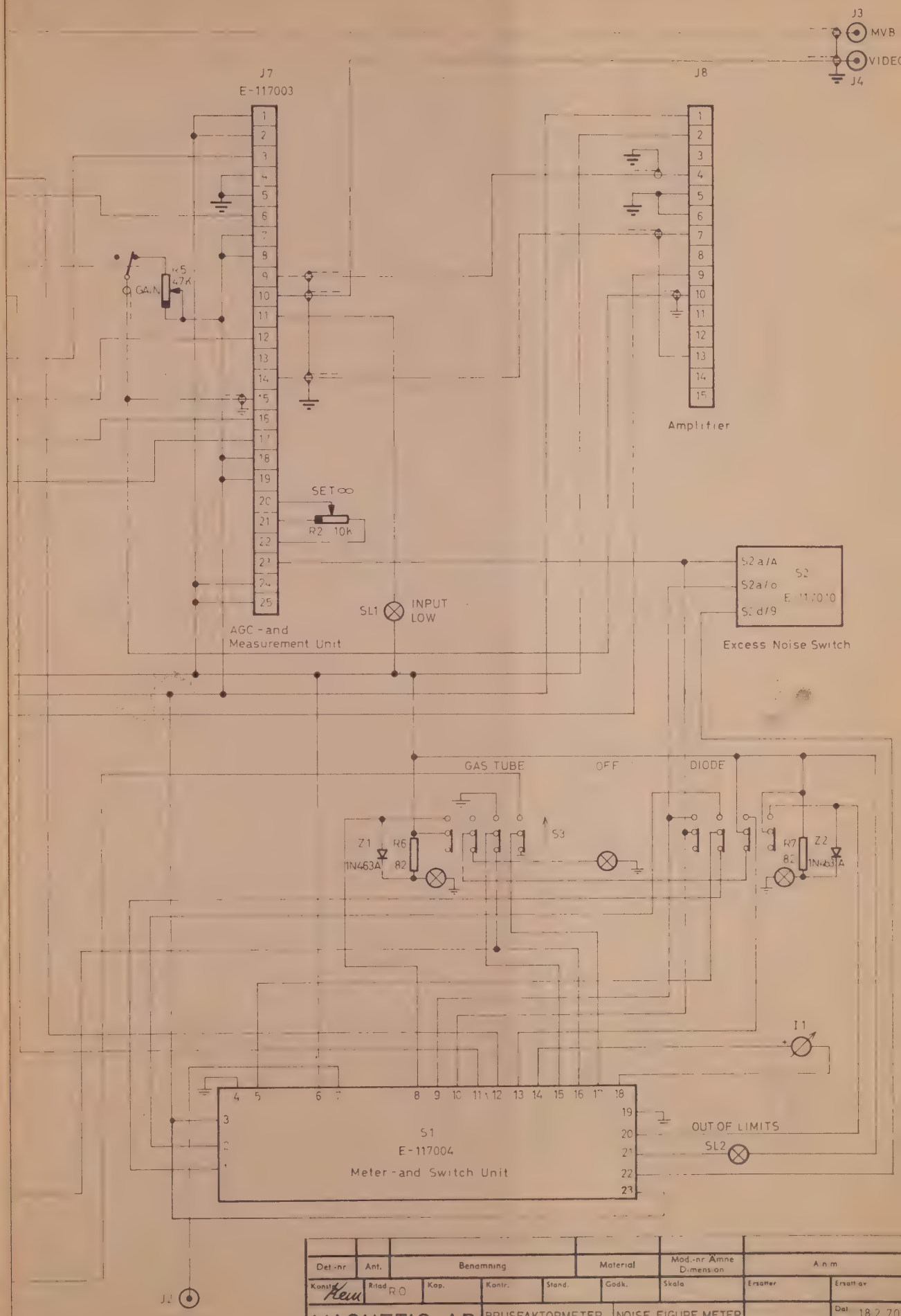
Circuit Diagram	E-117005
Component Layout	E-117023

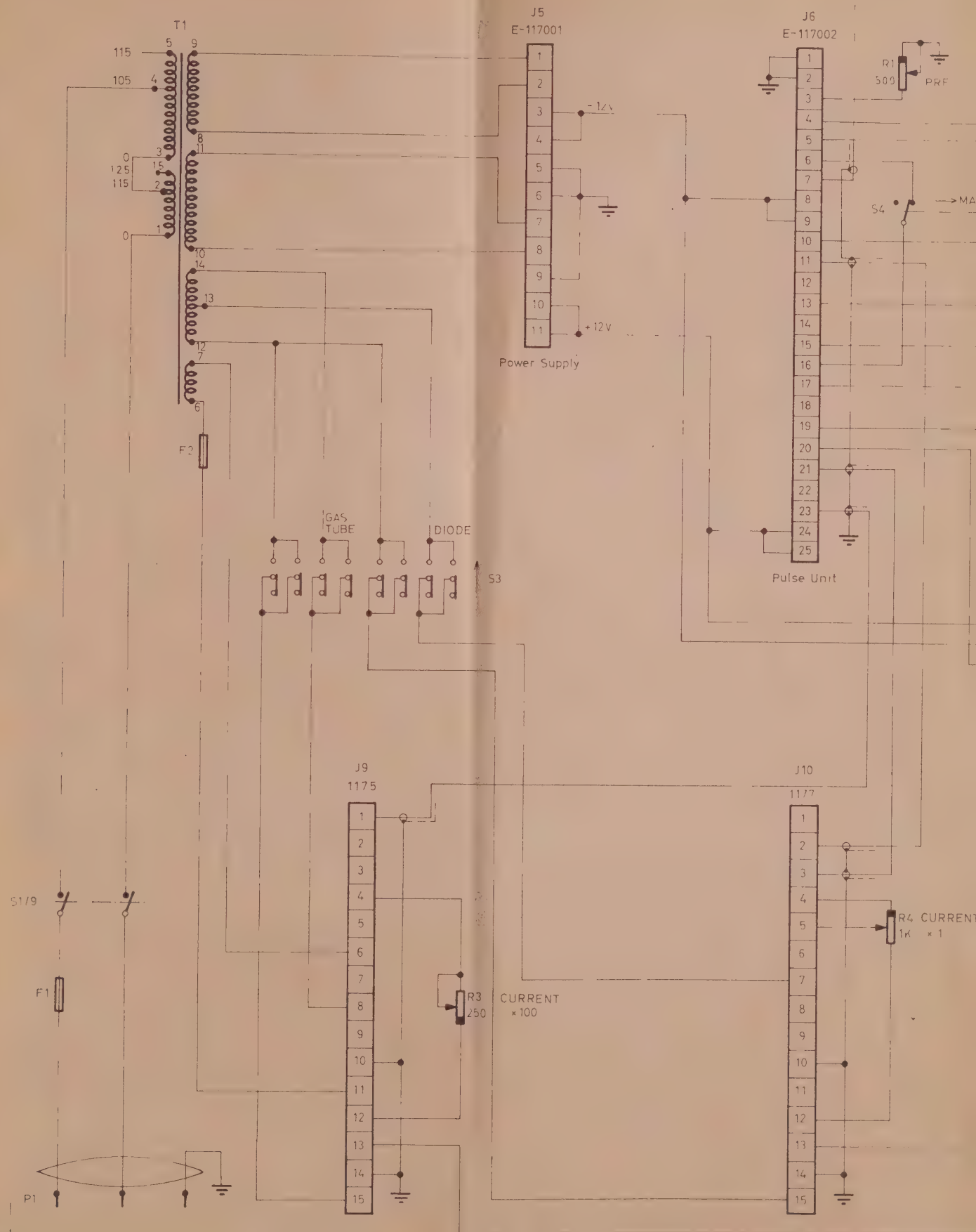
Modulator model 1177 (Diode)

Circuit Diagram	E-117026
Component Layout	E-117025

Amplifier models 1171 to 1173

For circuit diagrams see separate manual for these units.


J3
MVB
VIDEO
J4
J7
E-117003
J8
GAIN
x5
47K
SET ∞
R2 10k
AGC - and
Measurement Unit
SL1
INPUT
LOW
Amplifier
S2 a/A
S2a/o
S2 d/9
S2
E-117010
Excess Noise Switch
GAS TUBE
OFF
DIODE
S3
Z1
1N463A
R6
82
R7
82
Z2
1N463A
I1
S1
E-117004
Meter - and Switch Unit
OUT OF LIMITS
SL2
J2
RECORDER
Det.-nr
Ant.
Benämning
Material
Mod.-nr Ämne
Dimension
Anm
Konstr
Ritad R O
Kap.
Kontr.
Stand.
Godk.
Skala
Ersatter
Ersatt av
MAGNETIC AB
SWEDEN
BRUSFAKTORMETER
117
NOISE FIGURE METER
117
Förbindningsschema
Wiring Diagram
Dat 18 2 70
Ritn.-nr
E-117000



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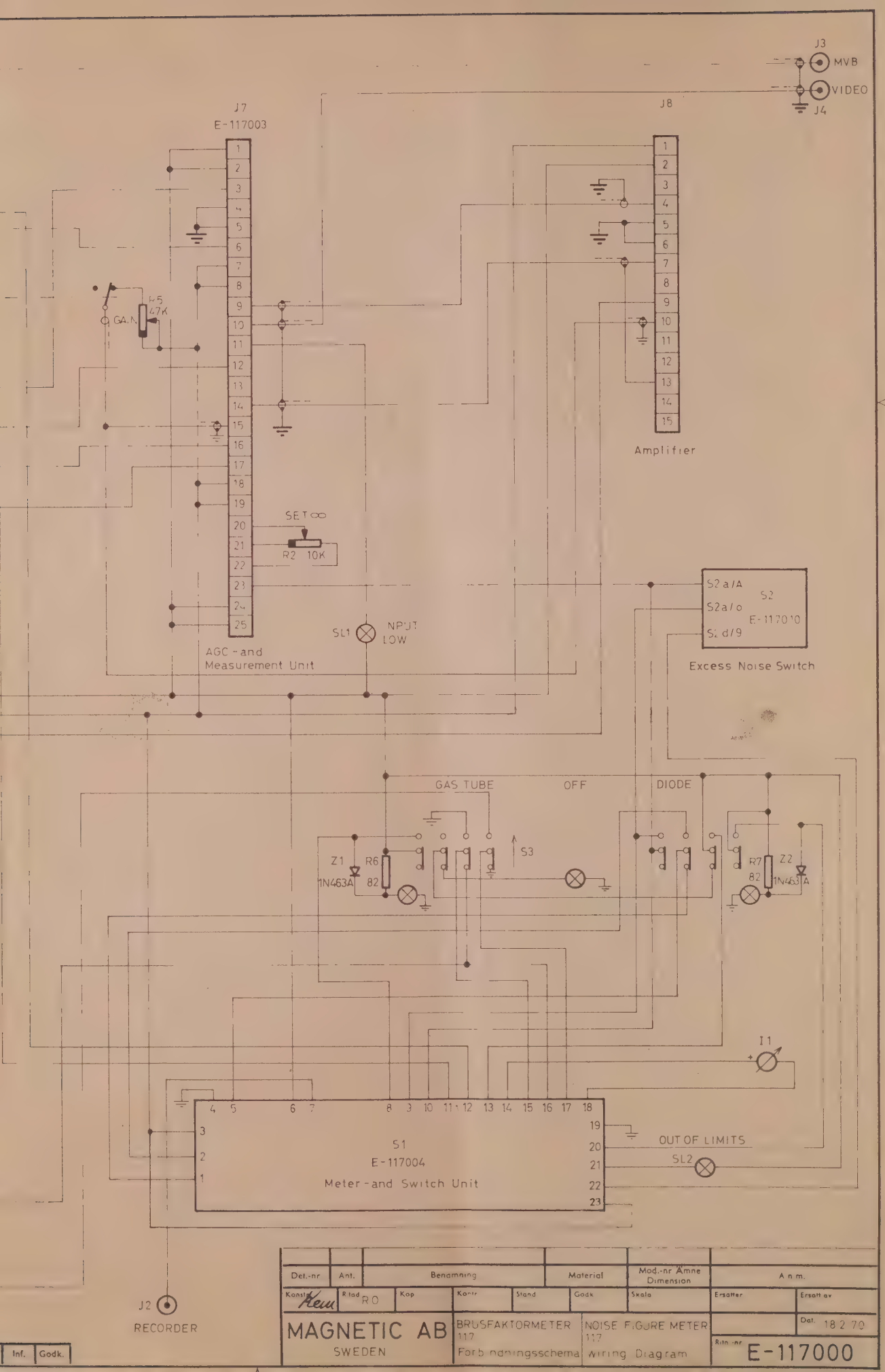
Nr	Ant	Ändring och/eller medd.-nr	Datum	Inf.	Godk.	Nr	Ant.	Ändring och eller medd.-nr	Datum	Inf.	Godk.	Nr	Ant.	Ändring och eller medd.-nr	Datum



Det.-nr	Ant.	Benämning	Material	Mod.-nr Ämne Dimension	Anm.
Konstr. Rev	Ritad RO	Kop	Kontr	Stand	Godk	Skala	Ersatter	Ersatt av
MAGNETIC AB SWEDEN	BRUSFAKTORMETER 117 Förbindningsschema	NOISE FIGURE METER 117 Wiring Diagram			Dat. 18 2 70
					Ritn.-nr E-117000

Inf.	Godk.

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
R1	Motstånd, var. Resistor, var.	500 ohm	0.25 W	20%	Lesa	9A1/A
R2	Motstånd, var. Resistor, var.	10 kohm	1.5 W	5%	Reliance	HEL 05-B10 3/4" slotted
R3	Motstånd, var. Resistor, var.	250 ohm	25 W	10%	Ohmite	o154
R4	Motstånd, var. Resistor, var.	1 kohm	1.5 W	5%	Reliance	HEL 05-B10 3/4" slotted
R5	Motstånd, var. Resistor, var.	47 kohm	0.2 W	20%	Lesa	9A1/B
R6	Motstånd, Resistor,	82 ohm	0.25 W	5%	Kamaya	RC-1/4S
R7	Motstånd Resistor	82 ohm	0.25 W	5%	Kamaya	RC-1/4S
F1	Säkringshållare Fuse Holder				H.Schurter AG	FEP 031.1001
	Säkring Fuse	220V/0.5A 115V/1A	Trög Slow Blow			5x20 mm
F2	Säkringshållare Fuse Holder				H.Schurter AG	FEP 031.1001
	Säkring Fuse	1 A	Trög Slow Blow			5x20 mm
I1	Instrument Meter				Magnetic AB	E-117009

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
J2	Kontakt, BNC Connector, BNC					UG-625/U
J3	Kontakt, BNC Connector, BNC					UG-625/U
J4	Kontakt, BNC Connector, BNC					UG-625/U
J5	Kontakt, 11 pol. Connector, 11 ways				ITT	12-302-021
	Kortkontakthållare Socket Support				ITT	13-094-007
	Styrskena med stopp Guide insert, locking type	1 st 1 pc			ITT	34-018-111
	Styrskena utan stop Guide insert, non-locking type	1 st 1 pc			ITT	14-018-111
	Skruv Screw	2 st 2 pcs			ITT	24-009-007
	Låsstift Fixing strip	2 st			ITT	14-005-001
J6	Kontakt, 25 pol. Connector, 25 ways				ITT	12-301-021
	Detaljer i övrigt se Other details, see J5	J5				
J7	Kontakt, 25 pol. Connector, 25 ways				ITT	12-301-021
	Detaljer i övrigt se Other details, see J5	J5				

MAGNETIC AB

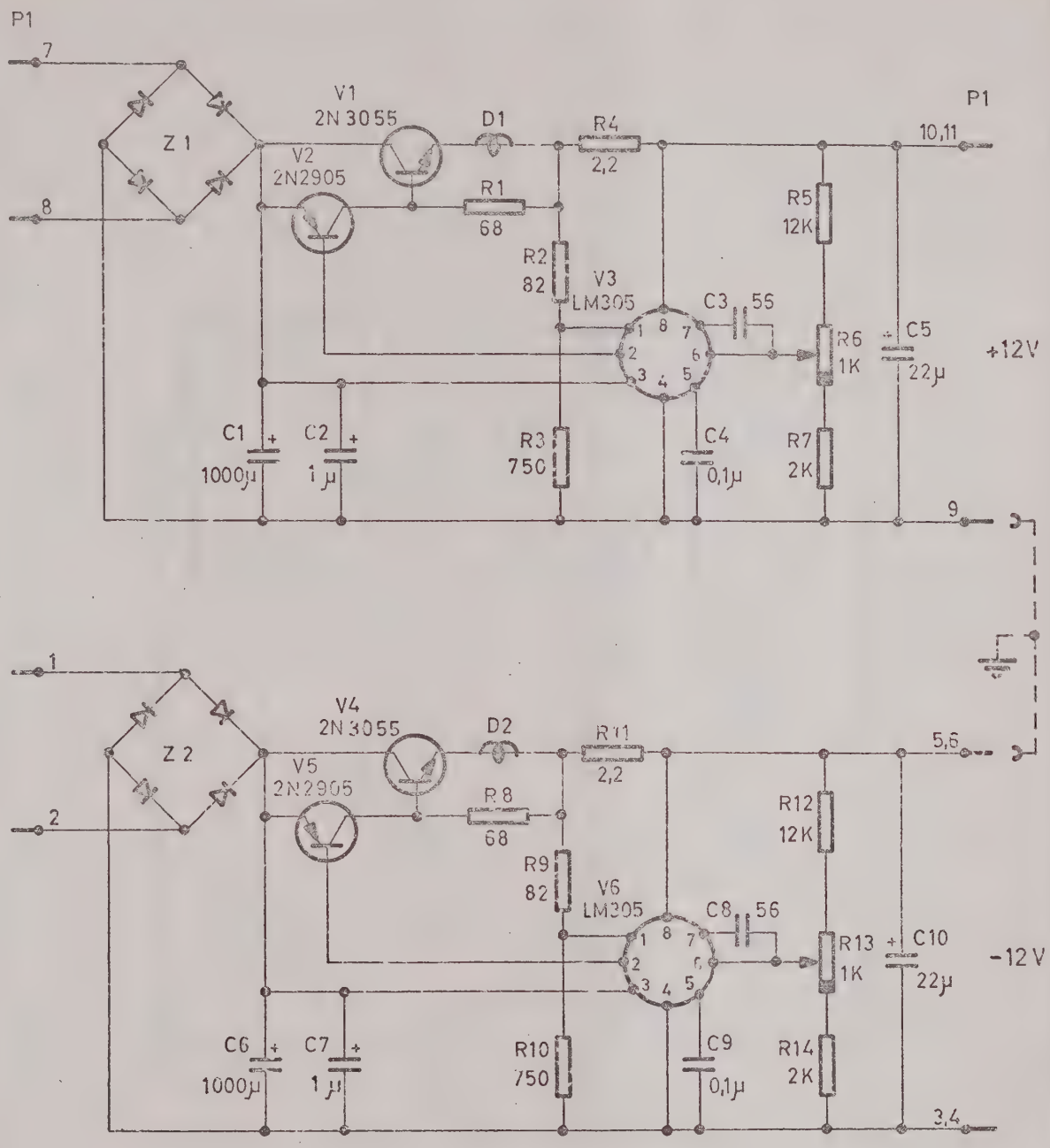
Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb.sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
J8	Kontakt, 15 pol. Connector, 15 ways				Amphenol	17-90150-16
J9	Kontakt, 15 pol. Connector, 15 ways				Amphenol	17-80150-16
J10	Kontakt, 15 pol. Connector, 15 ways				Amphenol	17-80150-16
P1	Nätkontakt Power Line Plug					
S1	Instrument- och omkopplingsenhet Meter- & Switch Unit				Magnetic AB	E-117004
S2	Omkopplare Switch				Magnetic AB	E-117010
S3	Tryckknappsomkopplare Push Button Switch				MEC	MXL-3A spec.
	Lampa 3 st Lamp 3 pcs	12 V 50 mA	T5.5		Taunuslicht	
S4	Strömbrytare Switch				NSF	8373. K8
SL1	Lamphållare Lamp holder				Olten	01-040
	Lins Lens				Olten	01-901.2
	Lampa Lamp	12 V 50 mA	T5.5		Taunuslicht	

Flytande Montage
Float Mounted

MAGNETIC AB

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
SL2	Lamphållare Lamp holder				Olten	01-040
	Lins Lens				Olten	01-901.2
	Lampa Lamp	12 V 50 mA	T5.5		Taunuslicht	
T1	Transformator Transformer				Elab	35149 B
Z1	Diod Diode					1N 463A
Z2	Diod Diode					1N 463A
	Ratt till R1 o.R5	2st			Elma	021-232
	Täcklock till d:o	2st			Elma	040-102
	Ratt till R3 o.R4	2st			Elma	020-352
	Täcklock till d:o	2st			Elma	040-302
	Muttertäckning till d:o	2st			Elma	044-302

DETTA RITNING FÖRBEHÅLLER VAR EGENDOM, ATT UTAN VÅRT MEDGIVANDE MÅNGFALDIGA, FÖREVISA, UTLÄMNA ELLER ELJEST OBEHÖRIGEN ANVÄNDA DENSAMMA ÄR FÖRBJUDET OCH BEIVRAS MED STÖD AV LAG AV DEN 30 MAJ 1919 SAMT LAG AV DEN 29 MAJ 1931 § 3.



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KOMPONENTPLACERING
COMPONENT LAYOUT

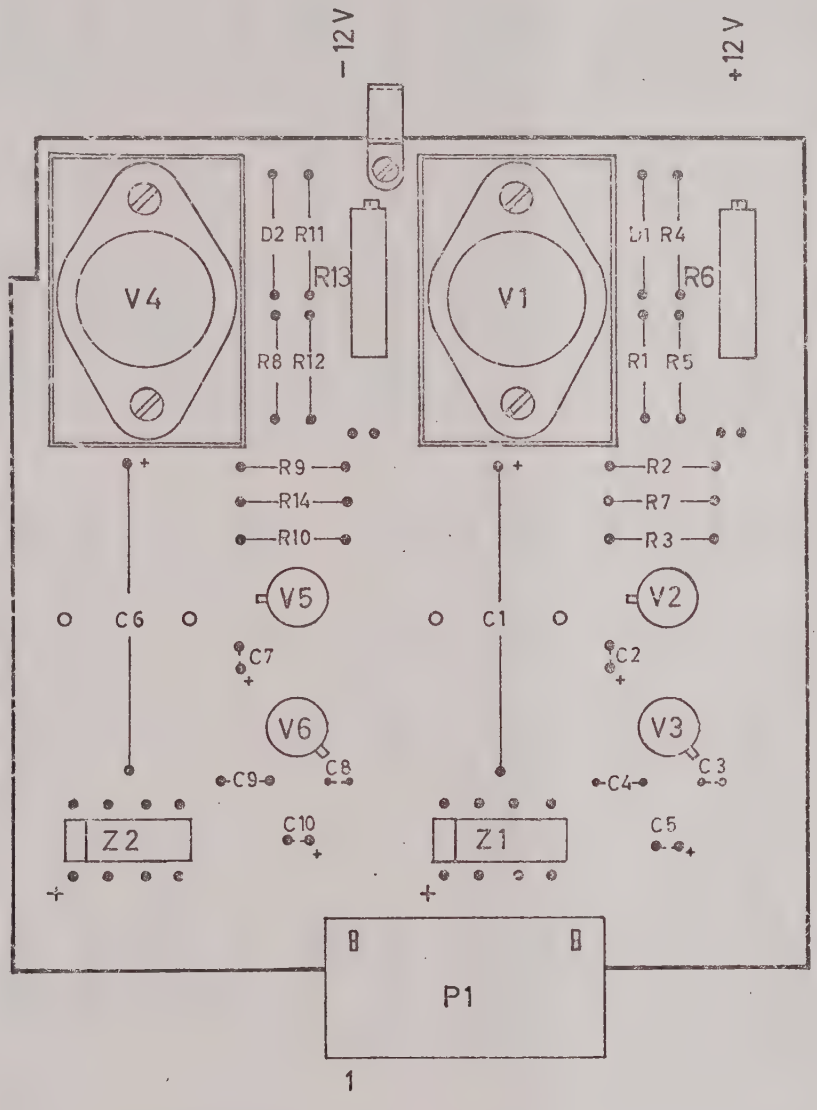
E-117015

Dwg-nr	Art.	Benämning	Material	Anm.
Konstr.	Ritad R.Ö.	Kop.	Konst.	Stand.	Godk.	Skala	Ersätter	Ersatt av

MAGNETIC AB Stockholm Sweden	LIKRIKTARE E-117001 Principschema	POWER SUPPLY E-117001 Circuit Diagram	Blad Dat 23.1.70 Ritn.-nr E-117001

223 Wikanders Tr. AB S-N

DENNA RITNING FÖRBLIVER VÅR EGENDOM, ATT UTAN VÅRT MEDGIVANDE MÅNGFALDIGA, FÖREVISA, UTLÄMNA ELLER ELJEST OBEHÖRIGEN ANVÄNDA DENSAMMA ÄR FÖRBJUDET OCH BEIVRAS MED STÖD AV LAG AV DEN 30 MAJ 1919 SAMT LAG AV DEN 29 MAJ 1931 § 3.



C1 och C6 bindes fast.
V1 och V4 monteras med kylfläns E-7231 och Distans E-211131
D1 och D2 fixeras med K.K. eller dyligt.

A 19.5.71 CG									Principschema E-117001	
									Hålritning E-117015	
Det.-nr	Ant.	Benämning			Material				Anm.	
Konstr.	Ritad CG	Kop.	Konstr.	Stand.	Godk.	Skala			Ersätter	Ersatt av
MAGNETIC AB Stockholm Sweden		LIKRIKTARE E-117001 Komponentplacering			POWER SUPPLY E-117001 Component Layout				Blad	Det. 10.12.69
									Ritn.-nr E-117015	

E-117001 Likriktare
Power Supply

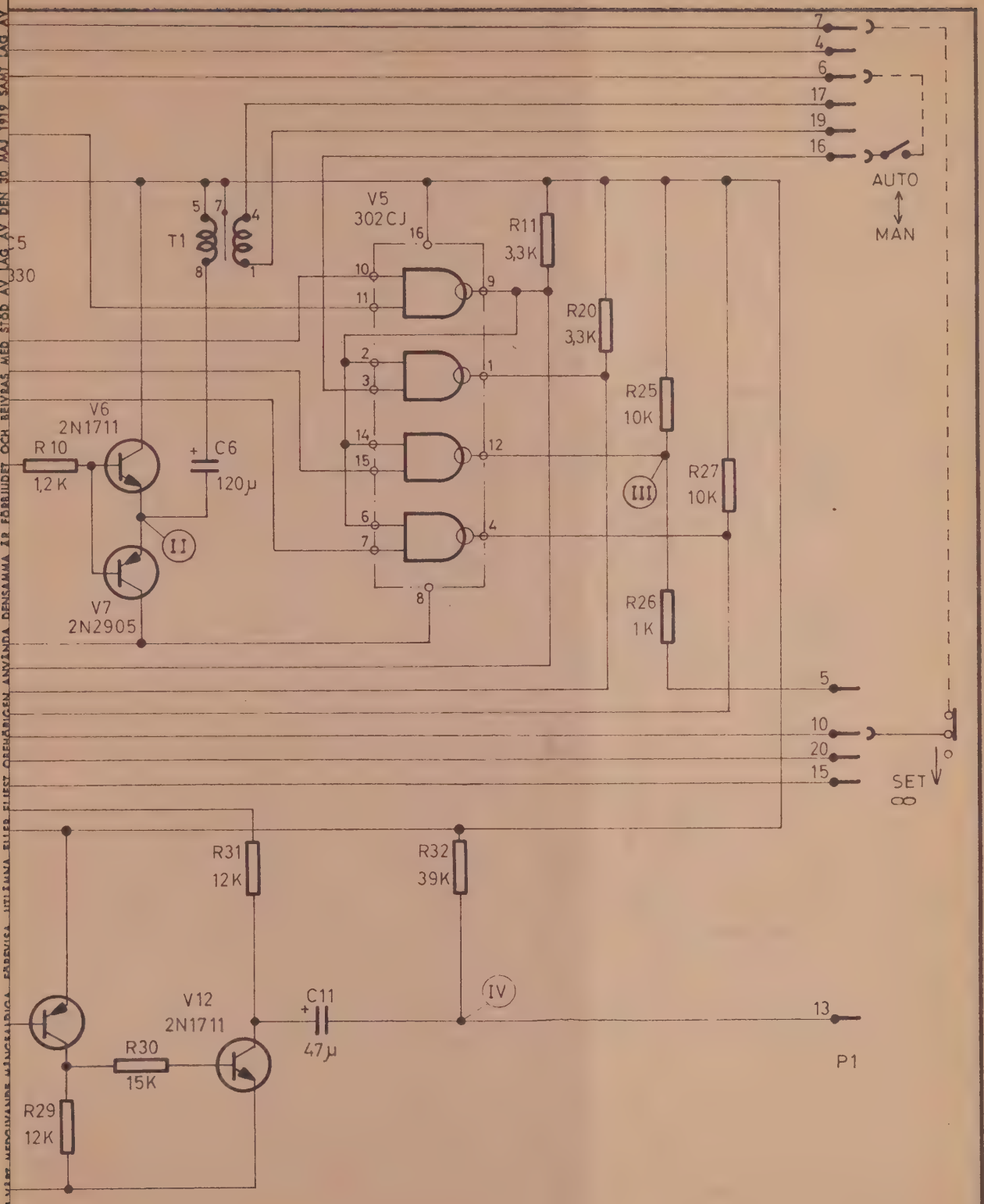
MAGNETIC AB

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
R1	Motstånd Resistor	68 ohm	0.5 W	5%	Vitrohm	GBT
R2	Motstånd Resistor	82 ohm	0.5 W	5%	Vitrohm	GBT
R3	Motstånd Resistor	750 ohm	0.5 W	5%	Vitrohm	GBT
R4	Motstånd Resistor	2.2 ohm	6 W	10%	Painton	5101
R5	Motstånd Resistor	12 kohm	0.125 W	1%	Vitrohm	CEA T2
R6	Motstånd, var. Resistor, var.	1 kohm	0.5 W		Bourns (Helipot)	3009 P (79P,89P)
R7	Motstånd Resistor	2 kohm	0.125 W	1%	Vitrohm	CEA T2
R8	Motstånd Resistor	68 ohm	0.5 W	5%	Vitrohm	GBT
R9	Motstånd Resistor	82 ohm	0.5 W	5%	Vitrohm	GBT
R10	Motstånd Resistor	750 ohm	0.5 W	5%	Vitrohm	GBT
R11	Motstånd Resistor	2.2 ohm	6 W	10%	Painton	5101
R12	Motstånd Resistor	12 kohm	0.125 W	1%	Vitrohm	CEA T2
R13	Motstånd, var. Resistor, var.	1 kohm	0.5 W		Bourns (Helipot)	3009P (79P,89P)
R14	Motstånd Resistor	2 kohm	0.125 W	1%	Vitrohm	CEA T2

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
C1	Kondensator, elyt Capacitor, elyt	1000 µF	25 V		Rifa	PEG 118 HG 410
C2	Kondensator, tantal Capacitor, tantalum	1 µF	35 V		ITT	TAG 1/35
C3	Kondensator, ker. Capacitor, cer.	56 pF	63 V	2%	LCC	GOP746 J4
C4	Kondensator, ker. Capacitor, cer.	0.1 µF	30 V		Erie	811
C5	Kondensator, tantal Capacitor, tantalum	22 µF	16 V		ITT	TAG 22/16
C6	Kondensator, elyt Capacitor, elyt	1000 µF	25 V		Rifa	PEG 118 HG410
C7	Kondensator, tantal Capacitor, tantalum	1 µF	35 V		ITT	TAG 1/35
C8	Kondensator, ker. Capacitor, cer.	56 pF	63 V		LCC	GOP746 J4
C9	Kondensator, ker. Capacitor, cer.	0.1 µF	30 V		Erie	811
C10	Kondensator, tantal Capacitor, tantalum	22 µF	16 V		ITT	TAG 22/16
D1	Drossel Choke	4 st i serie 4 beads in series			Philips	4322 020 34400
D2	Drossel Choke	4 st i serie 4 beads in series			Philips	4322 020 34400
P1	Kontakt, 11 pol Connector, 11 ways				ITT	12-212-001

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
	Mellanlägg Spacer				ITT	14-007-021
	Nit Rivet	2 st 2 pcs			ITT	14-014-002
V1	Transistor					2N 3055
V2	Transistor					2N 2905
V3	Integrerad krets IC				NS	LM 305
V4	Transistor					2N 3055
V5	Transistor					2N 2905
V6	Integrerad krets IC				NS	LM 305
Z1	Likriktare, brygga Rectifier, bridge				Philips (Varo)	BY 164 (VS 140)
Z2	Likriktare, brygga Rectifier, bridge				Philips (Varo)	BY 164 (VS 140)
	2 st kylfläns				Magnetic AB	E-7231
	4 st distans				Magnetic AB	E-211131
	1 st kabelklammer				Insuloid	NX2
	2 st underlägg f.TO5	(V2 o. V5)			Jermyn	TO5-001 eller liknande
	2 st underlägg	(V3 o.V6)			Jermyn	MON-8L eller liknande

DENNA RITNING FÅR EJ UTAN VÅRT SKRIFTLIGA GODKÄNNANDE KOPIERAS, ÖVERLÄMNAS ELLER PÅ ANNAT SÄTT OBEHÖRIGEN ANVÄNDAS TILL FÖRMÅN FÖR TREDJE MAN. ÖVERTRÄDELSE HÄRAV MEDFÖR SKADESTÅNDSSKYLDIGHET ENLIGT LAG. LAG AV DEN 30 MAJ 1919 SAMT LAG AV



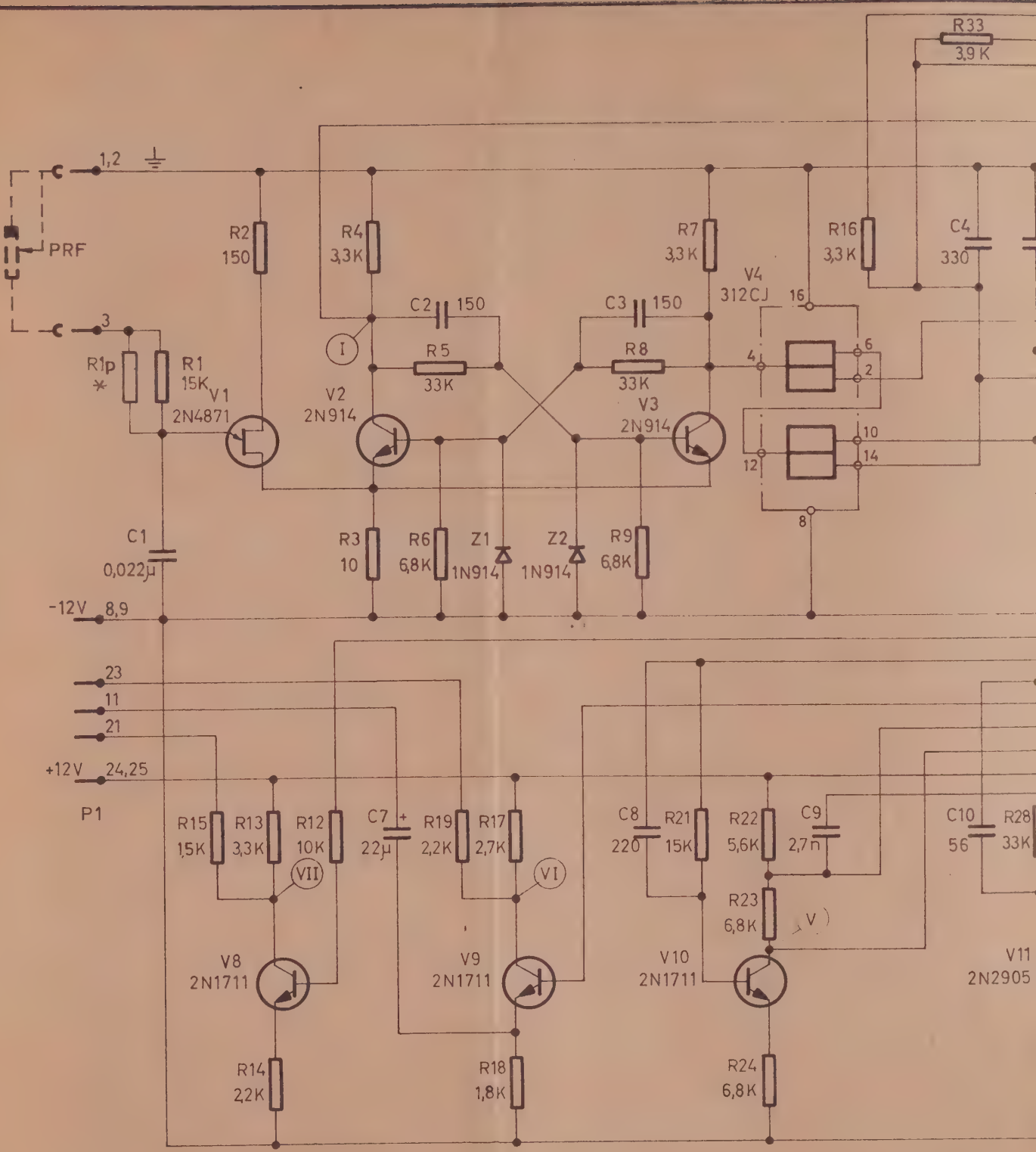
KOMPONENTPLACERING
COMPONENT LAYOUT | E-117017

Det. nr	Ant.	Benämning	Material	Anm.

Konstr.	Ritad	Kap.	Kontr.	Stand.	Godk.	Skala	Ersätter	Ersatt av
Hens	R.Ö.							

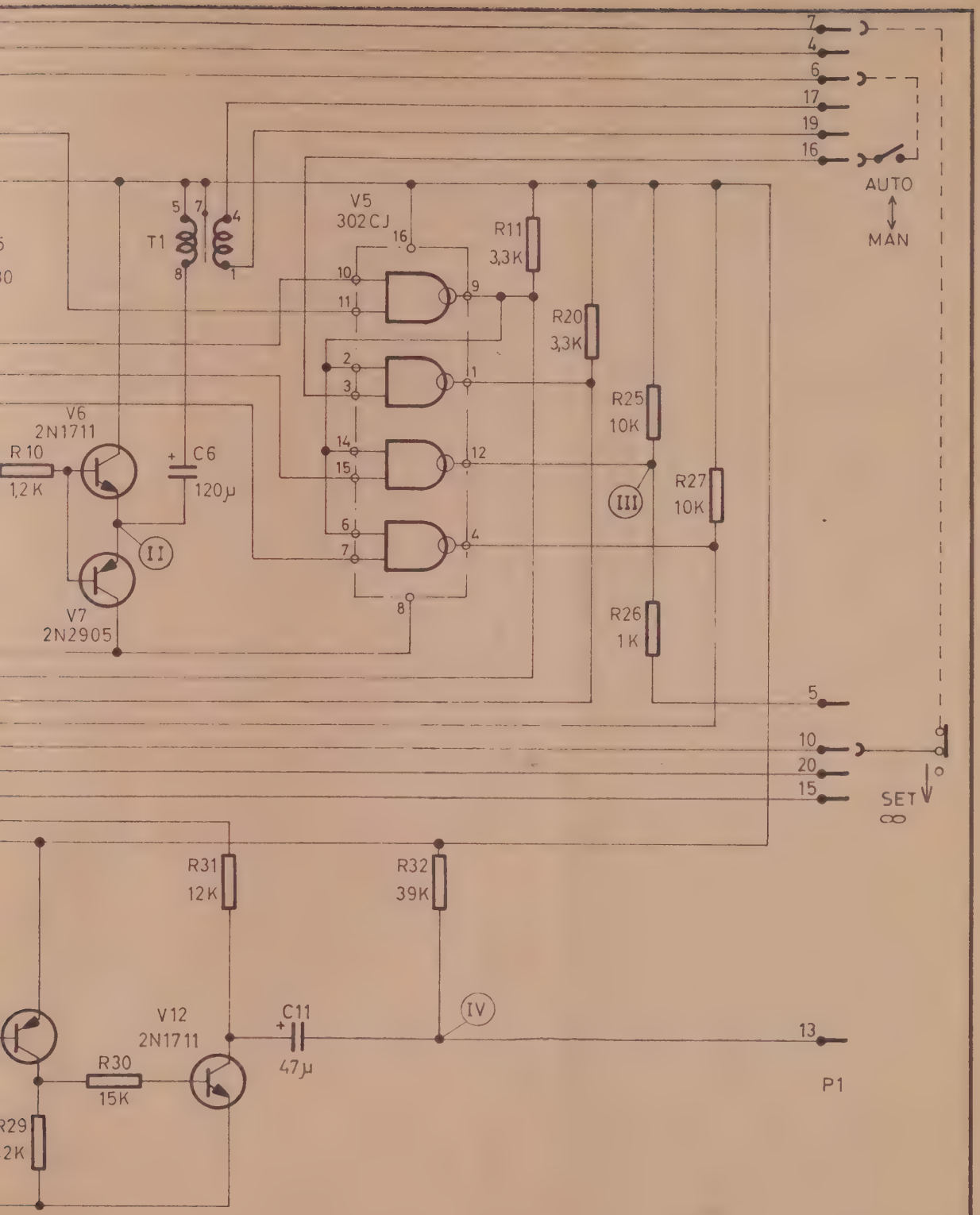
MAGNETIC AB Stockholm Sweden	117 PULSENHET Principschema	117 PULSE UNIT Circuit Diagram	Blad Dat. nr 4.2.70 Ritn.-nr E-117002

DENNA RITNING FÖRBLIVER VÅR EGENDOM, ATT UTAN VÅRT MEDGIVANDE MÅNGFALDIGA, FÖREVISA, UTLÄMNA ELLER ELJEST OBEHÖRIGEN ANVÄNDA DENSAMMA ÄR FÖRBJUDET OCH BEIVRAS MED STÖD AV LAG AV DEN 30 MAJ 1919 SAMT LAG AV DEN 29 MAJ 1931 § 3.



*/ Justeras vid fabrik
Adjusted at factory

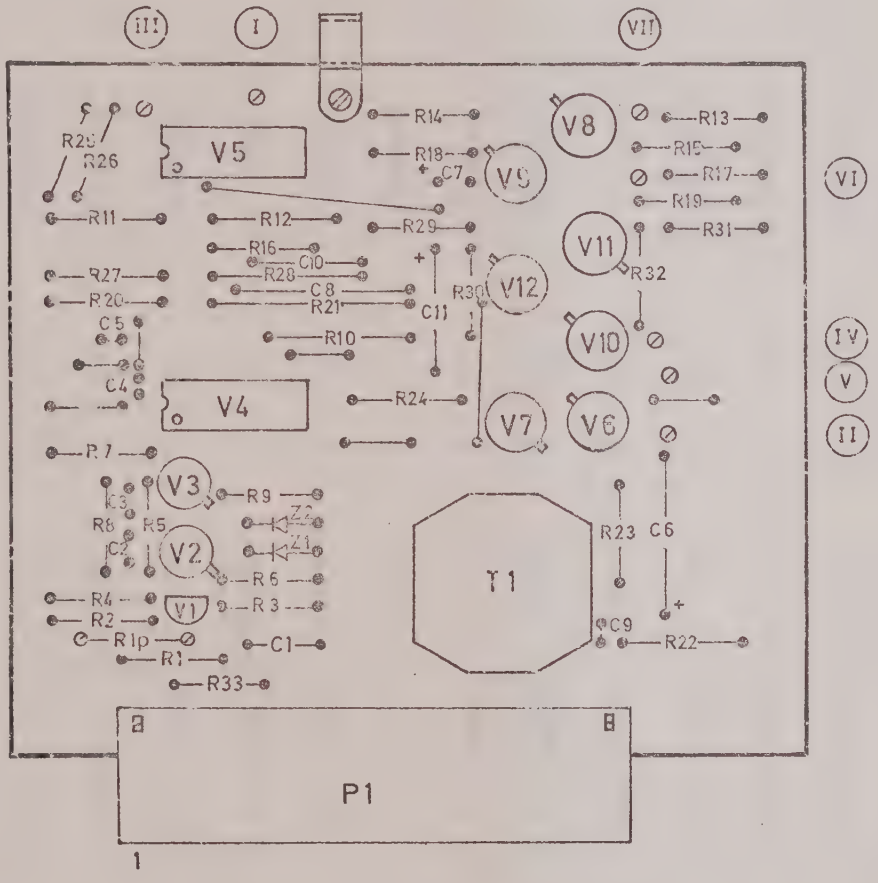
B 24.5.71 CG	
A 7.10 70	



KOMPONENTPLACERING
COMPONENT LAYOUT | E-117017

Det. nr	Ant.	Benämning	Material	Anm.
Konstr. Hans	Ritad R.Ö.	Kap.	Kontr.	Stand.	Godk.	Skala	Ersätter	Ersatt av
MAGNETIC AB Stockholm Sweden	117 PULSENHET Principschema	117 PULSE UNIT Circuit Diagram	Blad	Dat. nr 4 2 70
			Ritn.-nr E-117002	

DENNA RITNING FÖRBLIVER VÅR EGENDOM, ATT UTAN VÅRT MEDGIVANDE MÅNGFALDIGA, FÖREVISA, UTLÄMNA ELLER ELJEST OBEHÖRIGEN ANVÄNDA DENSAMMA ÄR FÖRBJUDET OCH BEIVRAS MED STÖD AV LAG AV DEN 30 MAJ 1919 SAMT LAG AV DEN 29 MAJ 1931 § 3.



⌀ = Lödnit

C8 och C10 isoleras

A 24.5.71 CG							Principschema E-117002		
							Hålritning E 117019		
Det.-nr	Ant.	Benämning		Material			Anm.		
Konstr.	Ritad CG	Kop.	Korstr.	Stand.	Godk.	Skala	Ersätter	Ersatt av	
MAGNETIC AB Stockholm Sweden		117 PULSENHET Komponentplacering		117 PULSE UNIT Component layout			Blad	Dat. 12.12.1969	
							Ritn.-nr E-117017		

E-117052 Pulse unit

MAGNETIC AB

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
R1	Motstånd Resistor	15 kohm	0.25 W	5%	Kamaya	RC-1/4S
R2	Motstånd Resistor	150 ohm	0.25 W	5%	Kamaya	RC-1/4S
R3	Motstånd Resistor	10 ohm	0.25 W	5%	Kamaya	RC-1/4S
R4	Motstånd Resistor	3.3 kohm	0.25 W	5%	Kamaya	RC-1/4S
R5	Motstånd Resistor	33 kohm	0.25 W	5%	Kamaya	RC-1/4S
R6	Motstånd Resistor	6.8 kohm	0.25 W	5%	Kamaya	RC-1/4S
R7	Motstånd Resistor	3.3 kohm	0.25 W	5%	Kamaya	RC-1/4S
R8	Motstånd Resistor	33 kohm	0.25 W	5%	Kamaya	RC-1/4S
R9	Motstånd Resistor	6.8 kohm	0.25 W	5%	Kamaya	RC-1/4S
R10	Motstånd Resistor	1.2 kohm	0.5 W	5%	Vitrohm	GBT
R11	Motstånd Resistor	3.3 kohm	0.5 W	5%	Vitrohm	GBT
R12	Motstånd Resistor	10 kohm	0.5 W	5%	Vitrohm	GBT
R13	Motstånd Resistor	3.3 kohm	0.5 W	5%	Vitrohm	GBT
R14	Motstånd Resistor	2.2 kohm	0.5 W	5%	Vitrohm	GBT
R15	Motstånd Resistor	1.5 kohm	0.5 W	5%	Vitrohm	GBT

MAGNETIC AB

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
R16	Motstånd Resistor	3.3 kohm	0.25 W	5%	Kamaya	RC-1/4S
R17	Motstånd Resistor	2.7 kohm	0.5 W	5%	Vitrohm	GBT
R18	Motstånd Resistor	1.8 kohm	0.5 W	5%	Vitrohm	GBT
R19	Motstånd Resistor	2.2 kohm	0.5 W	5%	Vitrohm	GBT
R20	Motstånd Resistor	3.3 kohm	0.5 W	50%	Vitrohm	GBT
R21	Motstånd Resistor	15 kohm	0.25 W	5%	Kamaya	RC-1/4S
R22	Motstånd Resistor	5.6 kohm	0.5 W	5%	Vitrohm	GBT
R23	Motstånd Resistor	6.8 kohm	0.5 W	5%	Vitrohm	GBT
R24	Motstånd Resistor	6.8 kohm	0.5 W	5%	Vitrohm	GBT
R25	Motstånd Resistor	10 kohm	0.5 W	5%	Vitrohm	GBT
R26	Motstånd Resistor	1 kohm	0.5 W	5%	Vitrohm	GBT
R27	Motstånd Resistor	10 kohm	0.5 W	5%	Vitrohm	GBT
R28	Motstånd Resistor	33 kohm	0.25 W	5%	Kamaya	RC-1/4S
R29	Motstånd Resistor	12 kohm	0.5 W	5%	Vitrohm	GBT
R30	Motstånd Resistor	15 kohm	0.25 W	5%	Kamaya	RC-1/4S

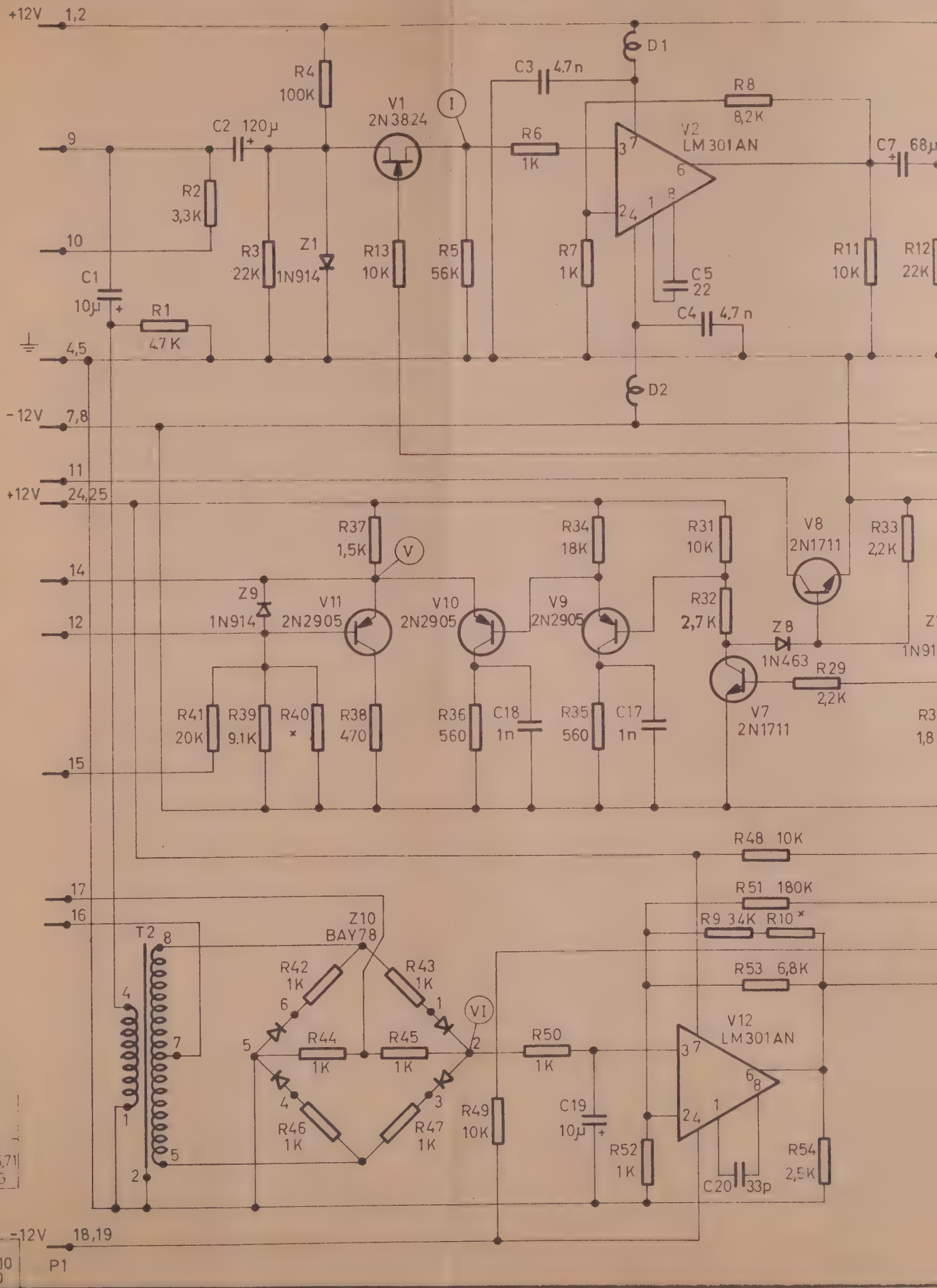
MAGNETIC AB

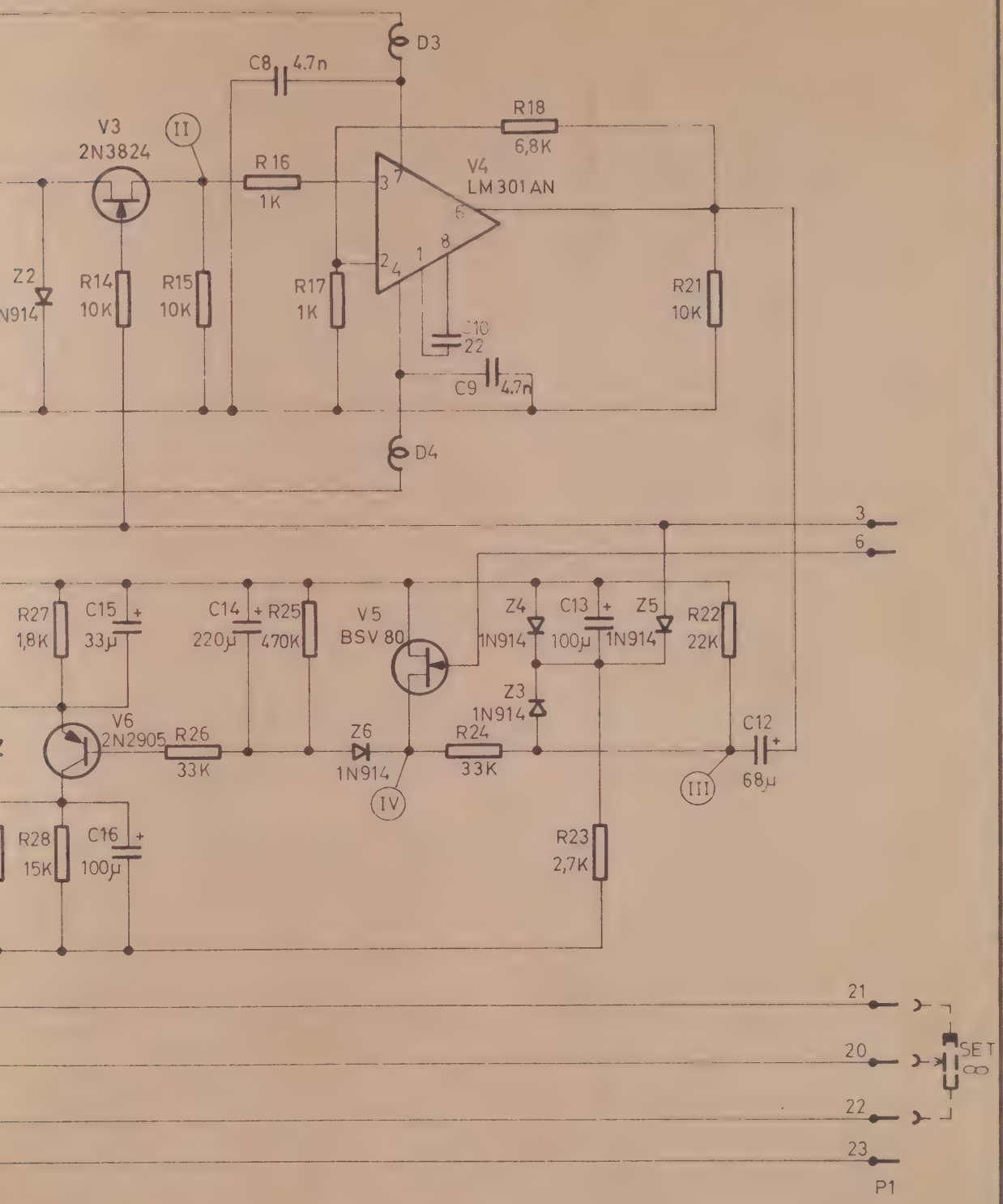
Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
R31	Motstånd Resistor	12 kohm	0.5 W	5%	Vitrohm	GBT
R32	Motstånd Resistor	39 kohm	0.5 W	5%	Vitrohm	GBT
R33	Motstånd Resistor	3.9 kohm	0.25 W	5%	Kamaya	RC-1/4S
C1	Kondensator, MP Capacitor, MP	0.022 µF	400 V	10%	Rifa	PME 2614/0.022
C2	Kondensator, ker. Capacitor, cer.	150 pF	63 V	2%	LCC	GOP 771 J4
C3	Kondensator, ker. Capacitor, cer.	150 pF	63 V	2%	LCC	GOP 771 J4
C4	Kondensator, ker. Capacitor, cer.	330 pF	63 V	2%	LCC	GOU 771 J4
C5	Kondensator, ker. Capacitor, cer.	330 pF	63 V	2%	LCC	GOU 771 J4
C6	Kondensator, tantal Capacitor, tantal	120 µF	10 V	20%	ITT	472-LWA-402 EA
C7	Kondensator, tantal Capacitor, tantal	22 µF	16 V	20%	ITT	TAG 22/16
C8	Kondensator, ker. Capacitor, cer.	220 pF	63 V	2%	LCC	GOU 767 J4
C9	Kondensator, ker. Capacitor, cer.	2.7 nF	63 V	10%	LCC	GOZ 746 J4
C10	Kondensator, ker. Capacitor, cer.	56 pF	63 V	2%	LCC	GOP 746 J4
C11	Kondensator, elyt Capacitor, elyt	47 µF	16 V		Rifa	PEG 112 GA 247

MAGNETIC AB

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
P1	Kontakt, 25 pol. Connector, 25 poles				ITT	12-211-001
ü	Mellanlägg Spacer					14-007-011
	Nit Rivet	2 st				14-014-002
T1	Transformator Transformer				Magnetic AB	E-117007
V1	Transistor				Motorola	2N 4871
V2	Transistor					2N 914
V3	Transistor					2N 914
V4	Integrerad krets IC				Amelco	312 CJ
V5	Integrerad krets IC				Amelco	302 CJ
V6	Transistor					2N 1711
V7	Transistor					2N 2905
V8	Transistor					2N 1711
V9	Transistor					2N 1711
V10	Transistor					2N 1711
V11	Transistor					2N 2905
V12	Transistor					2N 1711
Z1	Diod, Diode					1N 914
Z2	Diod, Diode					1N 914
	3st underlägg f.TO18	(V1-V3)			Jermyn	TO1[illegible]-003
	7st underlägg f.TO5	(V6-V12)			Jermyn	[illegible]

DENNA RITNING FÖRBLIVER VÅR EGENDOM, ATT UTAN VÅRT MEDGIVANDE MÅNGFALDIGA, FÖREVISA, UTLÄMNA ELLER ELJEST OBEHÖRIGEN ANVÄNDA DENSAMMA ÄR FÖRBJUDET OCH BEIVRAS MED STÖD AV LAG AV DEN 30 MAJ 1919 SAMT LAG AV DEN 29 MAJ 1931 § 3.





KOMPONENTPLACERING | E-117019
COMPONENT LAYOUT

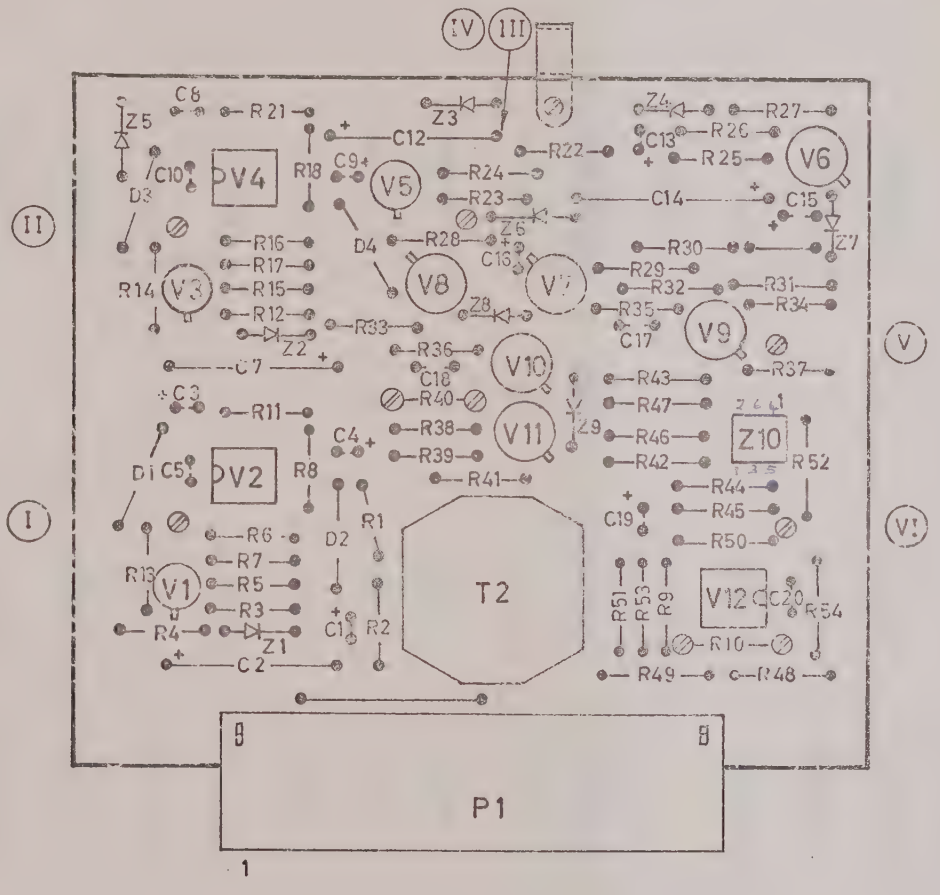
*UTPROVAS I FABRIK
SELECTED AT FACTORY

Det. nr	Ant.	Benämning	Material	Anm.

Konstr.	Ritad	Kap.	Kontr.	Stond.	Godk.	Skala	Ersätter	Ersatt av
Hans	R O							

MAGNETIC AB Stockholm Sweden	117 AGC-& MÄTENHET Principschema	117 AGC-and MEASUREMENT UNIT Circuit Diagram	Blad Dat. nr 5 2 70 Ritn.-nr E-117003

DENNA RITNING FÖRBLIVER VÅR EGENDOM, ATT UTAN VÅRT MEDGIVANDE MÅNGFALDIGA, FÖREVISA, UTLÄMNA ELLER ELJEST OBEHÖRIGEN ANVÄNDA DENSAMMA ÄR FÖRBJUDET OCH BEIVRAS MED STÖD AV LAG AV DEN 30 MAJ 1919 SAMT LAG AV DEN 29 MAJ 1931 § 3.



Lödnit

A 25.5.71 CG								Principschema E-117003	
								Hölritning E-117022	
Del.-nr	Ant.	Benämning		Material				Anm.	
Konstr.	Ritad CG	Kon	Konstr.	Stand.	Godk.	Skala		Ersätter	Ersatt av
MAGNETIC AB Stockholm Sweden		117 AGC & Mätenhet Komponentplacering		117 AGC and Measurement Unit Component Layout				Blad	Dat. 11.12.69
								Ritn.-nr E-117019	

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
R1	Motstånd Resistor	4.7 kohm	0.25 W	5%	Kamaya	RC-1/4S
R2	Motstånd Resistor	3.3 kohm	0.25 W	5%	Kamaya	RC-1/4S
R3	Motstånd Resistor	22 kohm	0.25 W	5%	Kamaya	RC-1/4SS
R4	Motstånd Resistor	100 kohm	0.25 W	5%	Kamaya	RC-1/4S
R5	Motstånd Resistor	56 kohm	0.25 W	5%	Kamaya	RC-1/4S
R6	Motstånd Resistor	1 kohm	0.125 W	1%	Vitrohm	CEA T2
R7	Motstånd Resistor	1 kohm	0.125 W	1%	Vitrohm	CEA T2
R8	Motstånd Resistor	8.2 kohm	0.125 W	1%	Vitrohm	CEA T2
R9	Motstånd Resistor	34 kohm	0.125 W	1%	Vitrohm	CEA T2
R10	Motstånd Resistor		0.25 W	5%	Kamaya	RC-1/4S
R11	Motstånd Resistor	10 kohm	0.25 W	5%	Kamaya	RC-1/4S
R12	Motstånd Resistor	22 kohm	0.25 W	5%	Kamaya	RC-1/4S
R13	Motstånd Resistor	10 kohm	0.25 W	5%	Kamaya	RC-1/4S
R14	Motstånd Resistor	10 kohm	0.25 W	5%	Kamaya	RC-1/4S
R15	Motstånd Resistor	10 kohm	0.25 W	5%	Kamaya	RC-1/4S

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb.sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
R16	Motstånd Resistor	1 kohm	0.125 W	1%	Vitrohm	CEA T2
R17	Motstånd Resistor	1 kohm	0.125 W	1%	Vitrohm	CEA T2
R18	Motstånd Resistor	6.8 kohm	0.125 W	1%	Vitrohm	CEA T2
R19	Motstånd Resistor					
R20	Motstånd Resistor					
R21	Motstånd Resistor	10 kohm	0.25 W	5%	Kamaya	RC-1/4S
R22	Motstånd Resistor	22 kohm	0.25 W	5%	Kamaya	RC-1/4S
R23	Motstånd Resistor	2.7 kohm	0.25 W	5%	Kamaya	RC-1/4S
R24	Motstånd Resistor	33 kohm	0.125 W	1%	Vitrohm	CEA TO
R25	Motstånd Resistor	470 kohm	0.125 W	1%	Vitrohm	CEB TO
R26	Motstånd Resistor	33 kohm	0.25 W	5%	Kamaya	RC-1/4S
R27	Motstånd Resistor	1.8 kohm	0.125 W	1%	Vitrohm	CEA T2
R28	Motstånd Resistor	15 kohm	0.125 W	1%	Vitrohm	CEA TO
R29	Motstånd Resistor	2.2 kohm	0.25 W	5%	Kamaya	RC-1/4S
R30	Motstånd Resistor	1,8 kohm	0.125 W	1%	Vitrohm	CEA T2

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb.sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
R31	Motstånd Resistor	10 kohm	0.25 W	5%	Kamaya	RC-1/4S
R32	Motstånd Resistor	2.7 kohm	0.25 W	5%	Kamaya	RC-1/4S
R33	Motstånd Resistor	2.2 kohm	0.25 W	5%	Kamaya	RC-1/4S
R34	Motstånd Resistor	18 kohm	0.25 W	5%	Kamaya	RC-1/4S
R35	Motstånd Resistor	560 ohm	0.25 W	5%	Kamaya	RC-1/4S
R36	Motstånd Resistor	560 ohm	0.25 W	5%	Kamaya	RC-1/4S
R37	Motstånd Resistor	1.5 kohm	0.25 W	5%	Kamaya	RC-1/4S
R38	Motstånd Resistor	470 ohm	0.25 W	5%	Kamaya	RC-1/4S
R39	Motstånd Resistor	9.1 kohm	0.125 W	1%	Vitrohm	CEA TO
R40	Motstånd Resistor		0.25 W	5%	Kamaya	RC-1/4S
R41	Motstånd Resistor	20 kohm	0.125 W	1%	Vitrohm	CEA TO
R42	Motstånd Resistor	1 kohm	0.125 W	0.25%	Vitrohm	MEA T2
R43	Motstånd Resistor	1 kohm	0.125 W	0.25%	Vitrohm	MEA T2
R44	Motstånd Resistor	1 kohm	0.125 W	0.25%	Vitrohm	MEA T2
R45	Motstånd Resistor	1 kohm	0.125 W	0.25%	Vitrohm	MEA T2

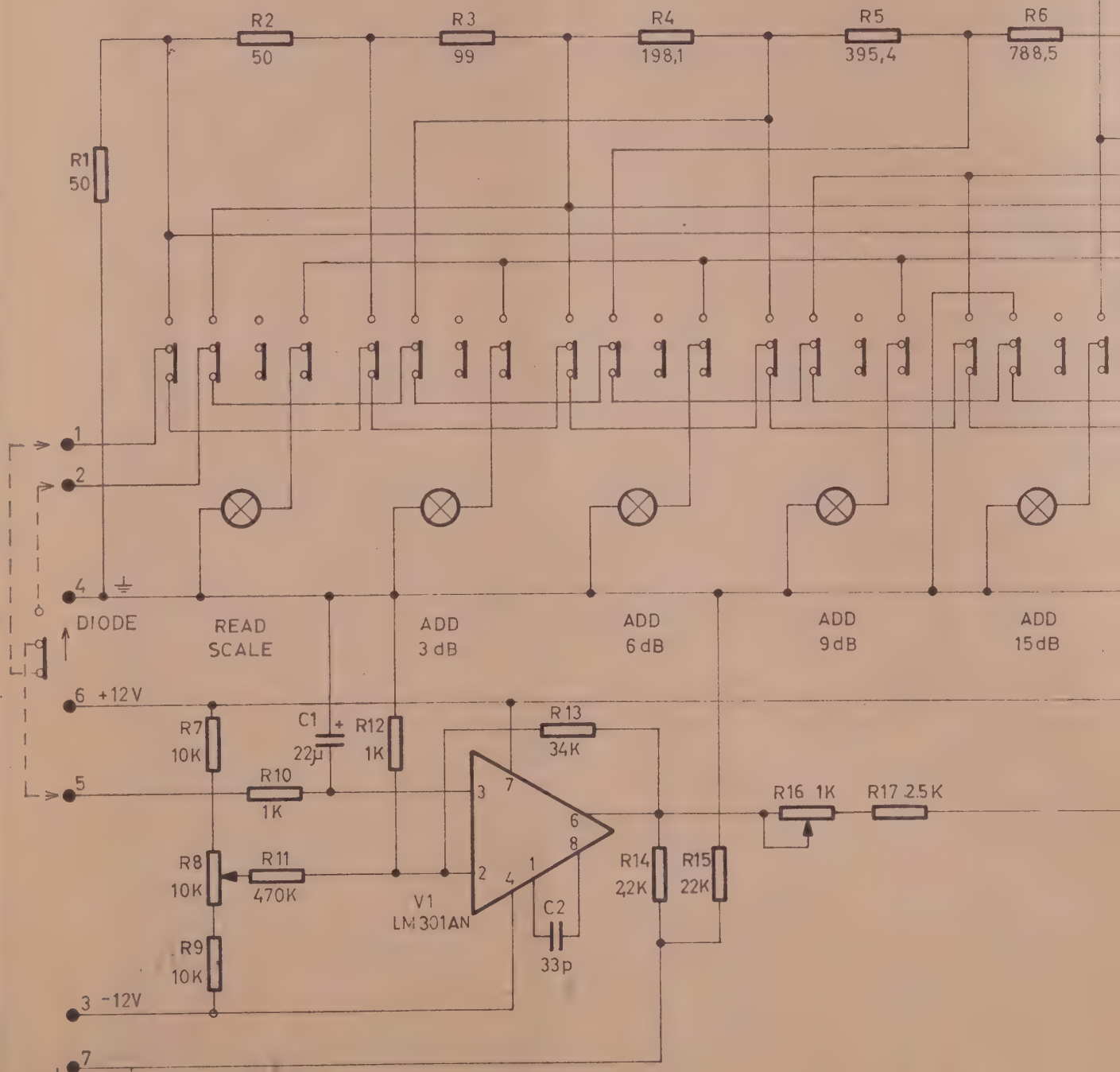
Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
R46	Motstånd Resistor	1 kohm	0.125 W	0.25%	Vitrohm	MEA T2
R47	Motstånd Resistor	1 kohm	0.125 W	0.25%	Vitrohm	MEA T2
R48	Motstånd Resistor	10 kohm	0.125 W	1%	Vitrohm	CEA T2
R49	Motstånd Resistor	10 kohm	0.125 W	1%	Vitrohm	CEA T2
R50	Motstånd Resistor	1 kohm	0.125 W	1%	Vitrohm	CEA T2
R51	Motstånd Resistor	180 kohm	0.125 W	1%	Vitrohm	CEA T0
R52	Motstånd Resistor	1 kohm	0.125 W	1%	Vitrohm	CEA T2
R53	Motstånd Resistor	6.8 kohm	0.125 W	1%	Vitrohm	CEA T2
R54	Motstånd Resistor	2.5 Kohm	0.125 W	1%	Vitrohm	CEA T2
C1	Kondensator, tantal Capacitor, tantal	10 µF	16 V	20%	ITT	TAG 10/16
C2	Kondensator, tantal Capacitor, tantal	120 µF	10 V	20%	ITT	472-LWA-402EA
C3	Kondensator, ker Capacitor, cer.	4.7 nF	63 V	10%	LCC	GOZ 767 J4
C4	Kondensator, ker Capacitor, cer	4.7 nF	63 V	10%	LCC	GOZ 767 J4
C5	Kondensator, ker. Capacitor, cer.	22 pF	63 V	2%	LCC	GOC 744 J4

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
C6	Kondensator Capacitor					
C7	Kondensator Capacitor	68 uF	16 V	20%	ITT	472-LWA-402FA
C8	Kondensator Capacitor	4.7 nF	63 V	10%	LCC	GOZ 767 J4
C9	Kondensator Capacitor	4.7 nF	63 V	10%	LCC	GOZ 767 J4
C10	Kondensator,ker. Capacitor, cer.	22 pF	63 V	2%	LCC	GOC 744 J4
C11	Kondensator Capacitor					
C12	Kondensator, tantal Capacitor, tantal	68 µF	16 V	20%	ITT	472-LWA-402FA
C13	Kondensator, tantal Capacitor, tantal	100 µF	3 V	20%	ITT	TAG 100/3
C14	Kondensator, tantal Capacitor, tantal	220 µF	10 V	20%	ITT	472-LWA-403EA
C15	Kondensator, tantal Capacitor, tantal	33 µF	10 V	20%	ITT	TAG 33/10
C16	Kondensator, tantal Capacitor, tantal	100 µF	3 V	20%	ITT	TAG 100/3
C17	Kondensator, ker. Capacitor, cer.	1 nF	63 V	10%	LCC	GOZ 744 J4
C18	Kondensator, ker. Capacitor, cer.	1 nF	63 V	10%	LCC	GOZ 744 J4
C19	Kondensator, tantal Capacitor, tantal	10 µF	16 V	20%	ITT	TAG 10/16
C20	Kondensator, ker. Capacitor, cer.	33 pF	63 V	2%	LCC	GOC 746 J4

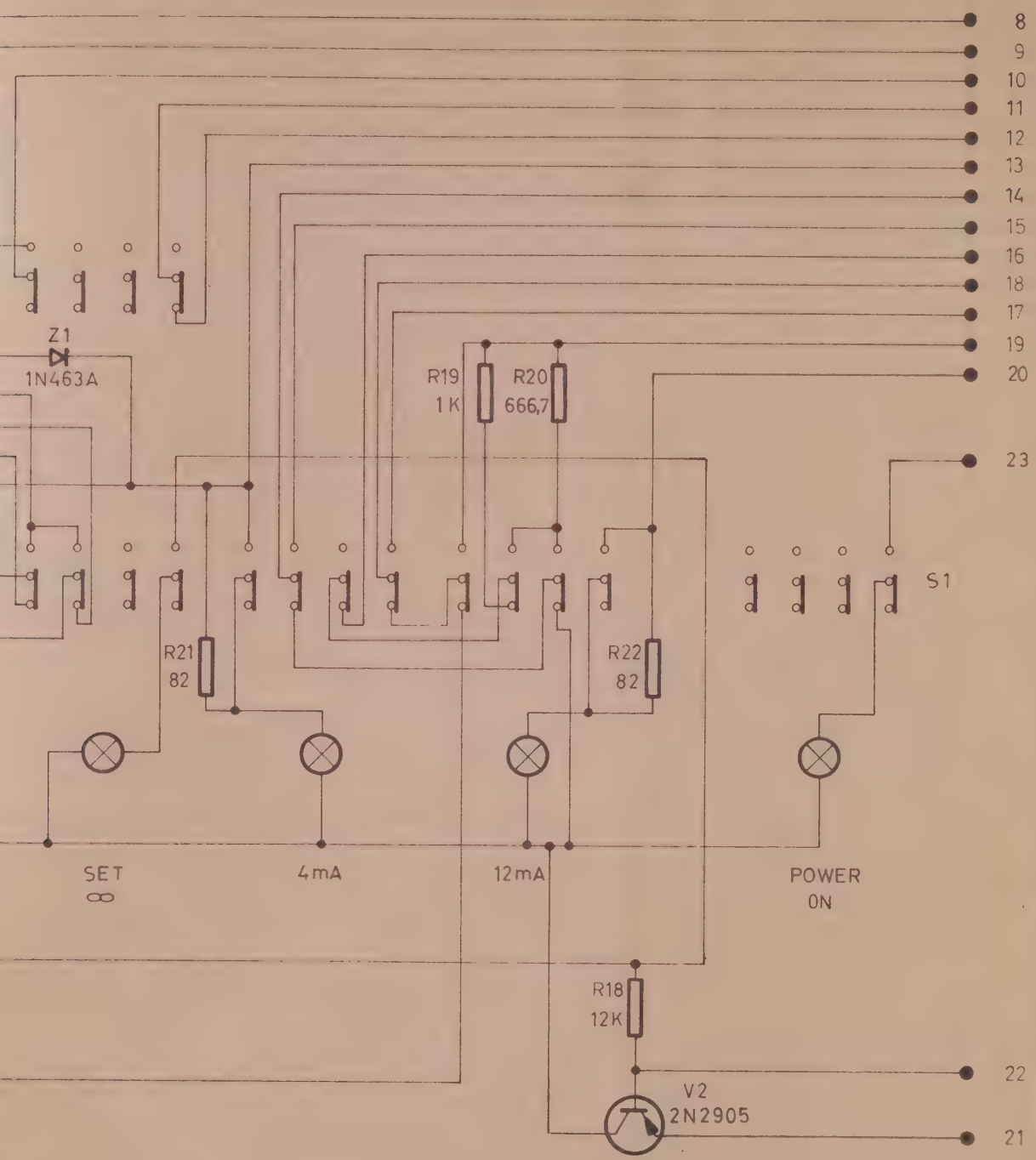
Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb.sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
D1	Drossel Choke	2 st i serie 2 beads in series			Philips	4322 020 34[illegible]
D2	Drossel Choke	2 st i serie 2 beads in series			Philips	4322 020 34[illegible]
D3	Drossel	2 st i serie 2 beads in series			Philips	4322 020 34400
D4	Drossel Choke	2 st i serie 2 beads in series			Philips	4322 020 34[illegible]
P1	Kontakt, 25 pol Connector, 25 ways				ITT	12-211-001
	Mellanlägg Spacer					14-007-011
	Nit Rivet	2 st 2 pcs				14-014-002
T2	Transformator Transformer				Magnetic AB	E-117008
V1	Transistor, FET					2N 3824
V2	Integrerad krets IC					LM 301 AN
V3	Transistor, FET					2N 3824
V4	Integrerad krets IC					LM 301 AN
V5	Transistor, FET				Philips	BSV 80
V6	Transistor,					2N 2905
V7	Transistor,					2N 1711

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
V3	Transistor,					2N 1711
V9	Transistor,					2N 2905
V10	Transistor,					2N 2905
V11	Transistor,					2N 2905
V12	Integrerad krets IC					LM 301AN
Z1	Diod Diode					1N 914
Z2	Diod Diode					1N 914
Z3	Diod Diode					1N 914
Z4	Diod Diode					1N 914
Z5	Diod Diode					1N 914
Z6	Diod Diode					1N 914
Z7	Diod Diode					1N 914
Z8	Diod Diode					1N 463A
Z9	Diod Diode					1N 914
Z10	Diod, kvartett Diode, quad				Telefunken	BAY 78
	Kabelklammer				Insuloid	
	3st underlägg f.TO18	(V1,V3,V5)			Jermyn	
	t underlägg f.TO5	(V6-V11)				

DENNA RITNING FÖRBLIVER VÅR EGENDOM, ATT UTAN VÅRT MEDGIVANDE MÅNGFALDIGA, FÖREVISA, UTLÄMNA ELLER ELJEST OBEHÖRIGEN ANVÄNDA DENSAMMA ÄR FÖRBJUDET OCH BEIVRAS MED STÖD AV LAG AV DEN 30 MAJ 1919 SAMT LAG AV DEN 29 MAJ 1931 § 3.



B	19.5.71 CG
A	9.10. 70

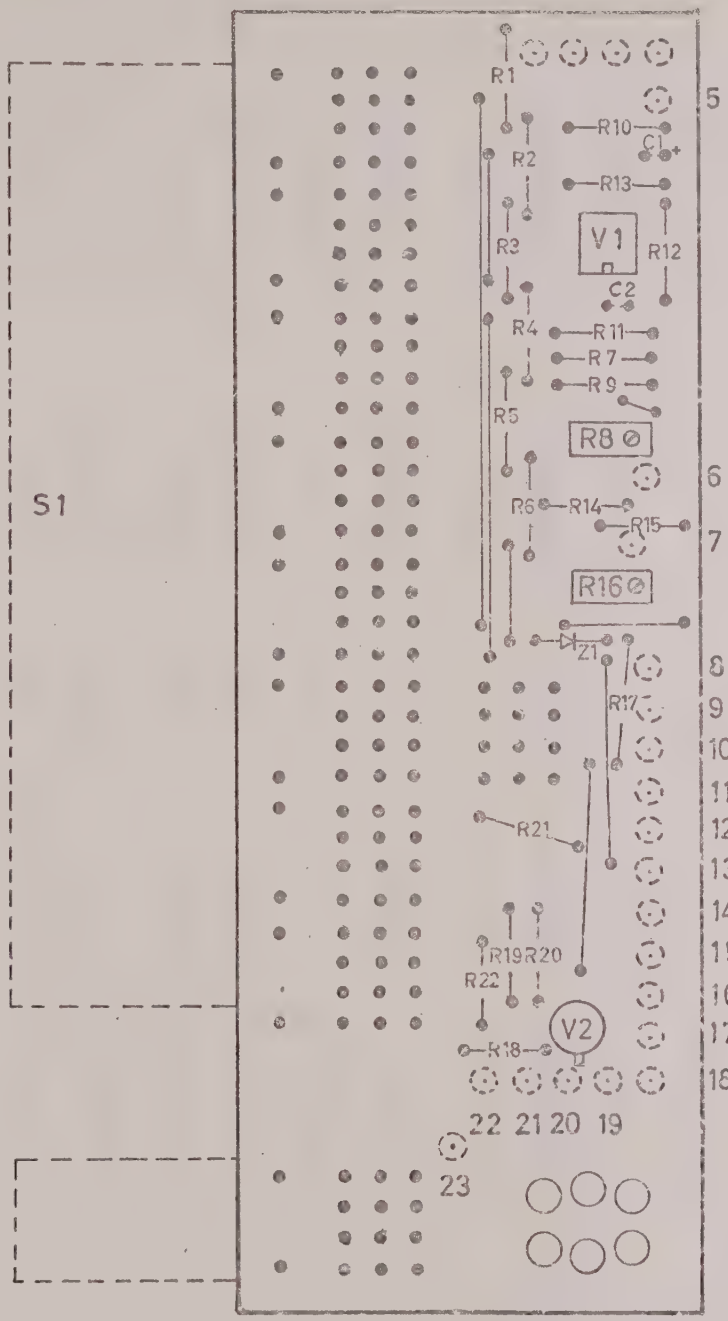


KOMPONENT PLACERING
COMPONENT LAYOUT | E-117021

Det. nr	Ant.	Benämning	Material	Anm.
Konstr. Ritad R.O.	Kap.	Kontr.	Stand.	Godk.	Skala	Ersätter	Ersatt av
MAGNETIC AB Stockholm Sweden	117 INSTRUMENT & OMKOPPLINGSENHET Principschema	117 METER-AND SWITCH UNIT Circuit Diagram				Blad	Dat. nr 22 X
						Ritn.-nr E-117004	

DENNA RITNING ÄR FASTEGENDOM, ATT UTAN VÅRT MEDGIVANDE MÅNGFALDIGA, FÖREVISA, UTLÄMNA ELLER ELJEST OBEHÖRIGEN ANVÄNDA DENSAMMA ÄR FÖRBJUDET OCH BELYDAS MED STÖD AV LAG AV DEN 30 MAJ 1919 SAMT LAG AV DEN 29 MAJ 1931 § 3.

1-23 Lödtorn monterade från lödsidan. (Elfa K1990)



A 19.5.71 CG									Hålritning	E-117022	
Det.-nr	Ant.	Benämning		Material							
Konstr.	Ritad CG	Lag	Konstr.	Sland.	Godk.	Skala 1:1			Ersätter	Ersatt av	
MAGNETIC AB Stockholm Sweden		117 Instrument- & Omkopplingsenhet -omponentplacering		117 Meter- and Switch Unit Component Layout					Stad	Dat. 3.12.69	
										E-117021	

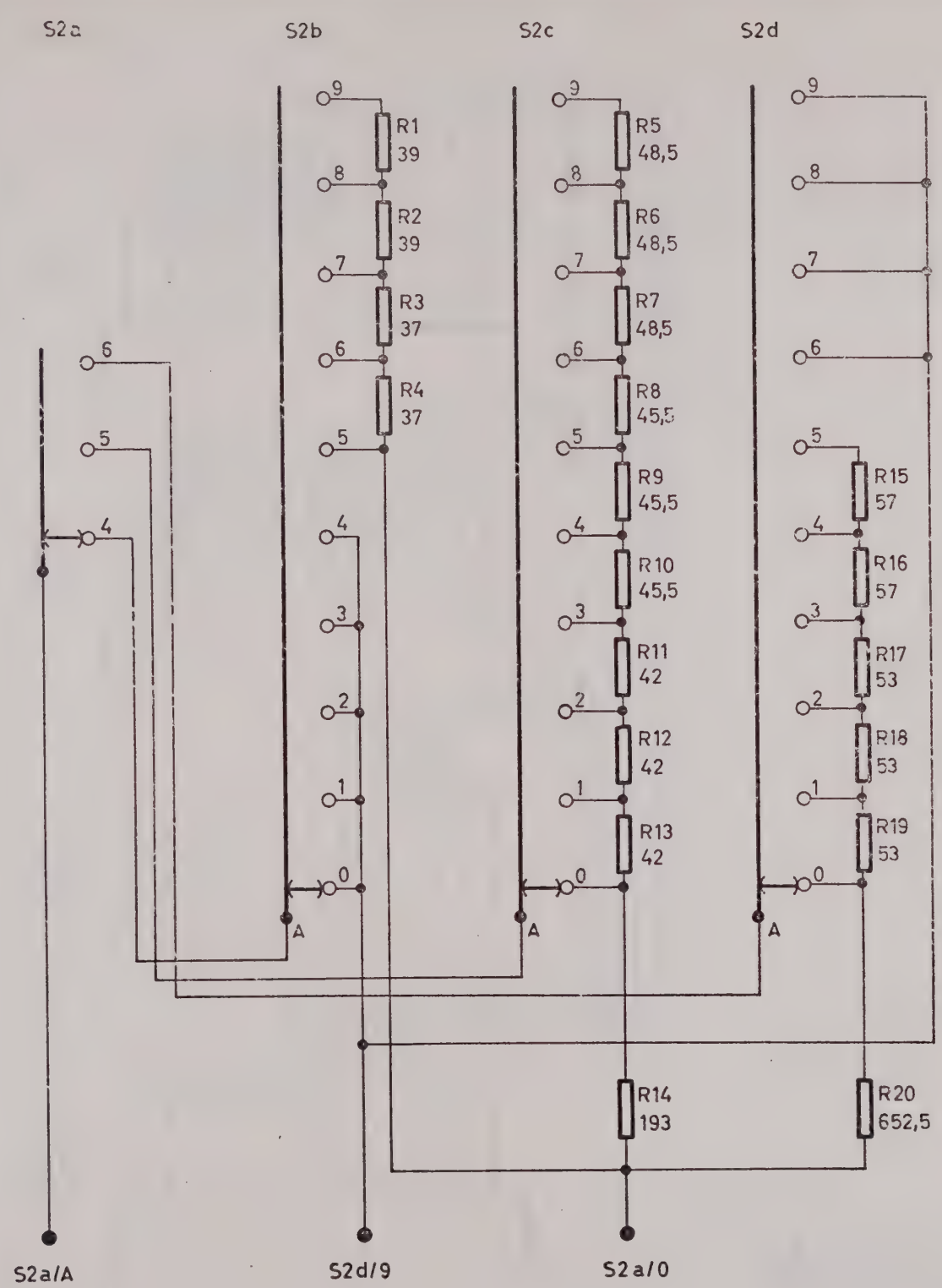
E-117004 Instrument- & Omkopplarenhet
Meter- and Switch Unit

MAGNETIC AB

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
R1	Motstånd Resistor	50 ohm	0.125 W	0.25%	Vitrohm	MEA T2
R2	Motstånd Resistor	50 ohm	0.125 W	0.25%	Vitrohm	MEA T2
R3	Motstånd Resistor	99 ohm	0.125 W	0.25%	Vitrohm	MEA T2
R4	Motstånd Resistor	198.1 ohm	0.125 W	0.25%	Vitrohm	MEA T2
R5	Motstånd Resistor	395.4 ohm	0.125 W	0.25%	Vitrohm	MEA T2
R6	Motstånd Resistor	788.5 ohm	0.125 W	0.25%	Vitrohm	MEA T2
R7	Motstånd Resistor	10 kohm	0.125 W	1%	Vitrohm	CEA T2
R8	Motstånd, var. Resistor, var.	10 kohm	0.5 W		Helipot	66W
R9	Motstånd Resistor	10 kohm	0.125 W	1%	Vitrohm	CEA T2
R10	Motstånd Resistor	1 kohm	0.125 W	1%	Vitrohm	CEA T2
R11	Motstånd Resistor	470 kohm	0.125 W	1%	Vitrohm	CEB T0
R12	Motstånd Resistor	1 kohm	0.125 W	1%	Vitrohm	CEA T2
R13	Motstånd Resistor	34 kohm	0.125 W	1%	Vitrohm	CEA T2
R14	Motstånd Resistor	2.2 kohm	0.25 W	5%	Kamaya	RC-1/4S
R15	Motstånd Resistor	22 kohm	0.25 W	5%	Kamaya	RC-1/4S

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
R16	Motstånd, var. Resistor, var.	1 kohm	0.5 W		Helipot	66 W
R17	Motstånd Resistor	2.5 Kohm	0.125 W	1%	Vitrohm	CEA T2
R18	Motstånd Resistor	12 kohm	0.25 W	5%	Kamaya	RC-1/4S
R19	Motstånd Resistor	1 kohm	0.125 W	1%	Vitrohm	CEA T2
R20	Motstånd Resistor	666.7 ohm	0.125 W	0.5%	Vitrohm	CEA TO
R21	Motstånd Resistor	82 ohm	0.25 W	5%	Kamaya	RC-1/4S
R22	Motstånd Resistor	82 ohm	0.25 W	5%	Kamaya	RC-1/4S
C1	Kondensator, tantal Capacitor, tantal	22 µF	16 V	20%	ITT	TAG 22/16
C2	Kondensator, ker. Capacitor, cer.	33 pF	63 V	2%	LCC	GOC 746 J4
S1	Tryckknappsomkopplare Push button switch				MEC	MXL-10B spec.
	Lampa 9 st Lamp 9 pcs	12 V 50 mA	T5.5		Taunuslicht	
V1	Integrerad krets IC					LM 301AN
V2	Transistor					2N 2905
Z1	Diod Diode					1N 463A
	1st Underlägg f. TO5	(V2)			Jermyn	TO5-001 eller liknande

DENNA RITNING FÖRBLIVER VÅR EGENDOM, ATT UTAN VÅRT MEDGIVANDE MÅNGFALDIGA, FÖREVISA, UTLÄMNA ELLER ELJEST OBEHÖRIGEN ANVÄNDA DENSAMMA ÄR FÖRBJUDET OCH BEIVRAS MED STÖD AV LAG AV DEN 30 MAJ 1919 SAMT LAG AV DEN 29 MAJ 1931 § 3.



S2b, S2c och S2d är gangade
S2b, S2c och S2d are ganged

Komponentplacering
Component Layout

E-117103

Det.-nr	Ant.	Benämning	Material	Anm.
Konstr.	Ritad R.Ö.	Kop.	Konstr.	Stand.	Godk.	Skala	Ersätter	Ersatt av
							Blad	Dat. 10.2 .70

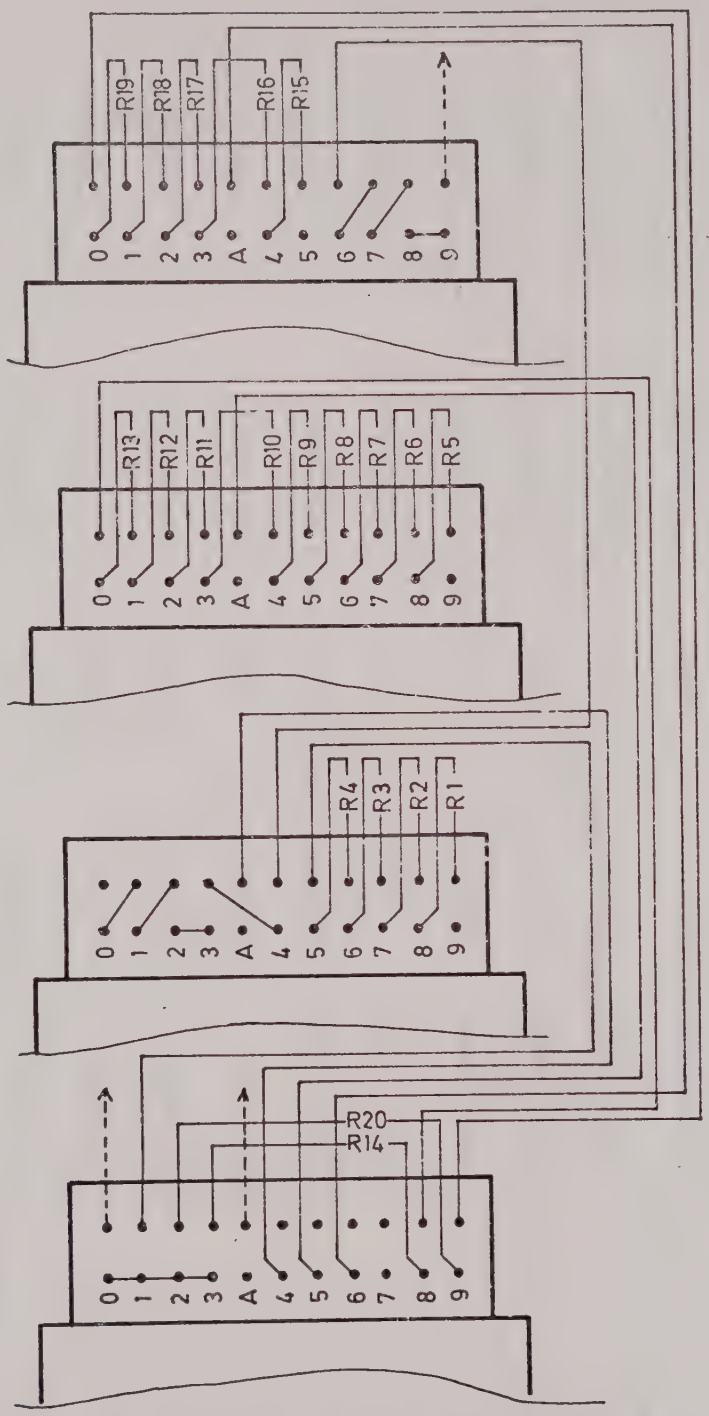
MAGNETIC AB
Stockholm Sweden

117
TILLSKOTTSBRUS-
OMKOPPLARE S2
Principschema

117
EXCESS NOISE
SWITCH S2
Circuit Diagram

Ritn.-nr
E-117010

DENNA RITNING FÖRBEHÅLLER VÅR EGENDOM, ATT UTAN VÅRT MEDGIVANDE MÅNGFALDIGA, FÖREVISA, UTLÄMNA ELLER ELJEST OBEHÖRIGEN ANVÄNDA DENSAMMA ÄR FÖRBJUDET OCH BEIVRAS MED STÖD AV LAG AV DEN 30 MAJ 1919 SAMT LAG AV DEN 29 MAJ 1931 § 3.



Längre anslutningstrådar till motstånden isoleras.

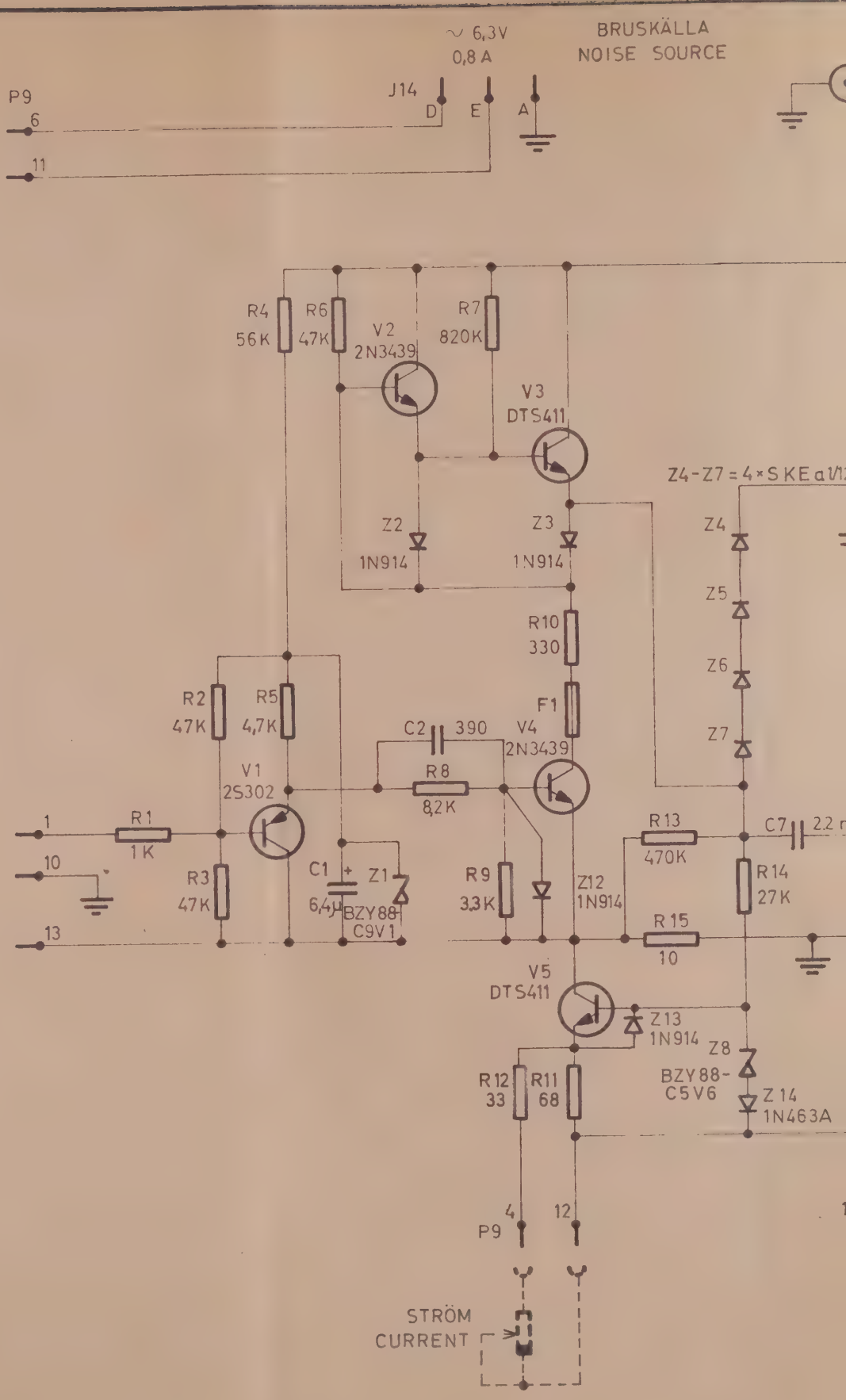
Trådlängd: a-b=60 mm
a-c=70 mm
a-d=80 mm
b-d=70 mm

							Principschema E-117010	
Det.-nr	Ant.	Benämning		Material			Anm.	
Konstr.	Ritad CG	Kop	Konstr.	Stand.	Godk.	Skala	Ersätter	Ersatt av
MAGNETIC AB Stockholm Sweden			117 Tillskottsbrus-omkopplare S2 Komponentplacering		117 Excess Noise Switch S2 Component Layout		Blad	Dat. 17.2.1970
							Ritn.-nr E-117103	

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
R1	Motstånd Resistor	39 ohm	0.125 W	0.5%	Vitrohm	CEA TO
R2	Motstånd Resistor	39 ohm	0.125 W	0.5%	Vitrohm	CEA TO
R3	Motstånd Resistor	37 ohm	0.125 W	0.5%	Vitrohm	CEA TO
R4	Motstånd Resistor	37 ohm	0.125 W	0.5%	Vitrohm	CEA TO
R5	Motstånd Resistor	48.5 ohm	0.125 W	0.5%	Vitrohm	CEA TO
R6	Motstånd Resistor	48.5 ohm	0.125 W	0.5%	Vitrohm	CEA TO
R7	Motstånd Resistor	48.5 ohm	0.125 W	0.5%	Vitrohm	CEA TO
R8	Motstånd Resistor	45.5 ohm	0.125 W	0.5%	Vitrohm	CEA TO
R9	Motstånd Resistor	45.5 ohm	0.125 W	0.5%	Vitrohm	CEA TO
R10	Motstånd Resistor	45.5 ohm	0.125 W	0.5%	Vitrohm	CEA TO
R11	Motstånd Resistor	42 ohm	0.125 W	0.5%	Vitrohm	CEA TO
R12	Motstånd Resistor	42 ohm	0.125 W	0.5%	Vitrohm	CEA TO
R13	Motstånd Resistor	42 ohm	0.125 W	0.5%	Vitrohm	CEA TO
R14	Motstånd Resistor	193 ohm	0.125 W	0.25%	Vitrohm	MEA T2
R15	Motstånd Resistor	57 ohm	0.125 W	0.5%	Vitrohm	CEA TO

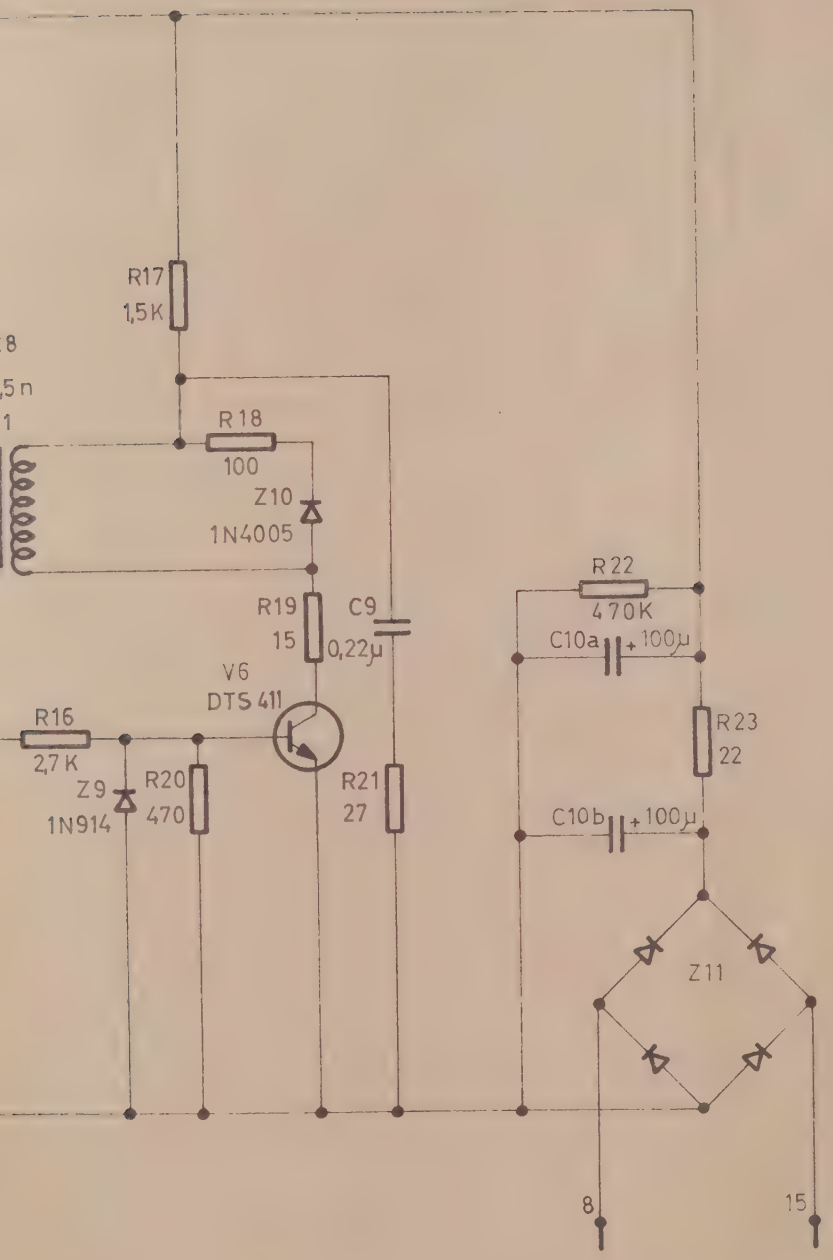
Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
R16	Motstånd Resistor	57 ohm	0.125 W	0.5%	Vitrohm	CEA T0
R17	Motstånd Resistor	53 ohm	0.125 W	0.5%	Vitrohm	CEA T0
R18	Motstånd Resistor	53 ohm	0.125 W	0.5%	Vitrohm	CEA T0
R19	Motstånd Resistor	53 ohm	0.125 W	0.5%	Vitrohm	CEA T0
R20	Motstånd Resistor	652.5 ohm	0.125 W	0.25%	Vitrohm	MEA T2
S2	Tumhjulsomkopplare Thumbwheel Switch				Contraves	
S2a	Omkopplare, med anslag Switch with stops				Contraves	M010/A46 svart black
S2b	Omkopplare Switch				Contraves	M010 svart black
S2c	Drabantomkopplare Slave Switch				Contraves	M010/B svart black
S2d	Drabantomkopplare Slave Switch				Contraves	M010/B svart black
	Fästvinklar End plates				Contraves	MW svart black
	Distansbult Assembly Rod	2 st 2 pcs			Contraves	M2x40
	Spårmutter Assembly Nut	4 st 4 pcs			Contraves	M2

DENNA RITNING FÖRBLIVER VÅR EGENDOM, ATT UTAN VÅRT MEDGIVANDE MÅNGFALDIGA, FÖREVISA, UTLÄMNA ELLER ELJEST OBEHÖRIGEN ANVÄNDA DENSAMMA ÄR FÖRBJUDET OCH BEIVRAS MED STÖD AV LAG AV DEN 30 MAJ 1919 SAMT LAG AV DEN 29 MAJ 1931 § 3.



B	
8.9.71	
CG	
A	
9.10.70	

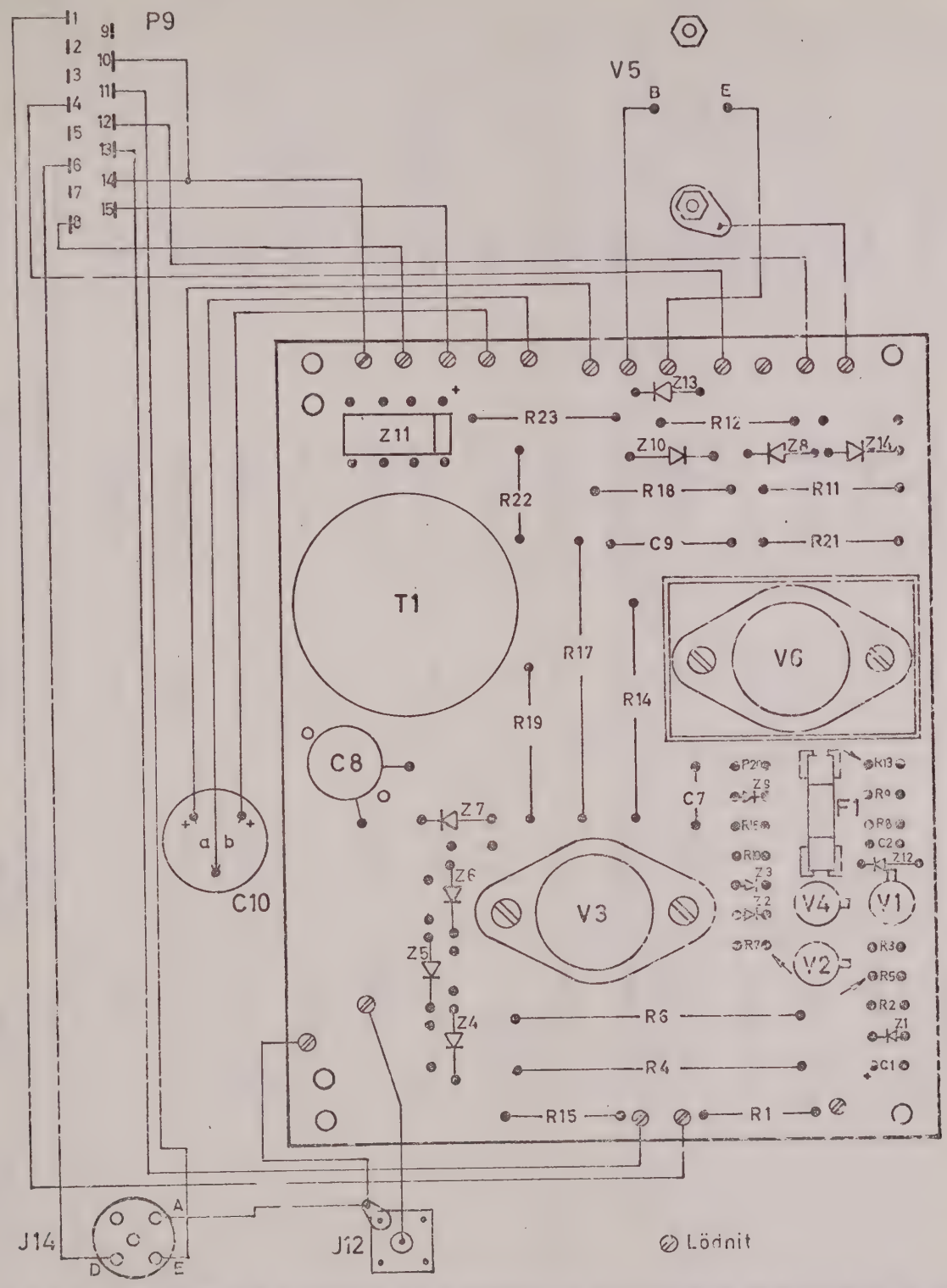
J12



KOMPONENTPLACERING:
COMPONENT LAYOUT: E-117023

Det. nr	Ant.	Benämning	Material	Anm.
Konstr	Ritad R.Ö	Kap. / Kontr. / Stand. / Godk. / Skala	Ersatter	Ersatt av
MAGNETIC AB Stockholm Sweden	MODULATOR 1175 Principschema	MODULATOR 1175 Circuit Diagram	Blad	Dat. nr 21.1.70
			Ritn.-nr E-117005	

DENNA RITNING FÖRBLIVER VÅR EGENDOM, ATT UTAN VÅRT MEDGIVANDE MÅNGFALDIGA, FÖREVISA, UTLÄMNA ELLER ELJEST OBEHÖRIGEN ANVÄNDA DENSAMMA ÄR FÖRBJUDET OCH BEIVRAS MED STÖD AV LAG AV DEN 29 MAJ 1919 SAMT LAG AV DEN 29 MAJ 1931 § 3.



C8 bindes fast. R4, R6, R11, R12, R14, R17, R18, R19, R21 o. R23 monteras upphöjda från TL-kort.
V5 monteras isolerad från gavel.
V6 monteras med kylfläns E-7231 och distans E-211131
V3 monteras med distans E-211131
mätpunkt åtkomlig från komp. sidan

A	6.6.71	CG

Princip schema E-117005
Härledning E-117024

Der.-nr	Ant.	Benämning	Material	Anm.
Konstr.	Rität CG	Kop	Konstr.	Stand.	Godk.	Skala 1:1	Ersatter	Ersatt av
							Blad	Datum 2.12.69

MAGNETIC AB
Stockholm Sweden

MODULATOR
1175
Komponentplacering

MODULATOR
1175
Component Layout

Ritn.-nr E-117023

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
R1	Motstånd Resistor	1 kohm	0.5 W	5%	Vitrohm	GBT
R2	Motstånd Resistor	47 kohm	0.5 W	5%	Vitrohm	GBT
R3	Motstånd Resistor	47 kohm	0.5 W	5%	Vitrohm	GBT
R4	Motstånd Resistor	56 kohm	10 W	5%	Philips	2322 320 12
R5	Motstånd Resistor	4.7 kohm	0.5 W	5%	Vitrohm	GBT
R6	Motstånd Resistor	47 kohm	10 W	5%	Philips	2322 320 12
R7	Motstånd Resistor	820 kohm	0.5 W	5%	Vitrohm	GBT
R8	Motstånd Resistor	8.2 kohm	0.5 W	5%	Vitrohm	GBT
R9	Motstånd Resistor	3.3 kohm	0.5 W	5%	Vitrohm	GBT
R10	Motstånd Resistor	330 ohm	0.5 W	5%	Vitrohm	GBT
R11	Motstånd Resistor	68 ohm	5.5 W	10%	Philips	2322 320 31
R12	Motstånd Resistor	33 ohm	5.5 W	10%	Philips	2322 320 31
R13	Motstånd Resistor	470 kohm	0.5 W	5%	Vitrohm	GBT
R14	Motstånd Resistor	27 kohm	8 W	5%	Philips	2322 320 22
R15	Motstånd Resistor	10 ohm	0.5 W	1%	Vitrohm	CEC TO

MAGNETIC AB

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
R16	Motstånd Resistor	2.7 kohm	0.5 W	5%	Vitrohm	GBT
R17	Motstånd Resistor	1.5 kohm	5 W	5%	Vitrohm	210-4
R18	Motstånd Resistor	100 ohm	5.5 W	10%	Philips	2322 320 31
R19	Motstånd Resistor	15 ohm	5.5 W	10%	Philips	2322 320 31
R20	Motstånd Resistor	470 ohm	0.5 W	5%	Vitrohm	GBT
R21	Motstånd Resistor	27 ohm	5.5 W	10%	Philips	2322 320 31
R22	Motstånd Resistor	470 kohm	0.5 W	5%	Vitrohm	GBT
R23	Motstånd Resistor	22 ohm	5.5 W	10%	Philips	2322 320 31
C1	Kondensator, elyt Capacitor, elyt	6.4 µF	25 V		Philips	2222 001 16643
C2	Kondensator, ker Capacitor, cer	390 pF	500 V	10 %	Eire	831
C3	Kondensator Capacitor					
C4	Kondensator Capacitor					
C5	Kondensator Capacitor					
C6	Kondensator Capacitor					

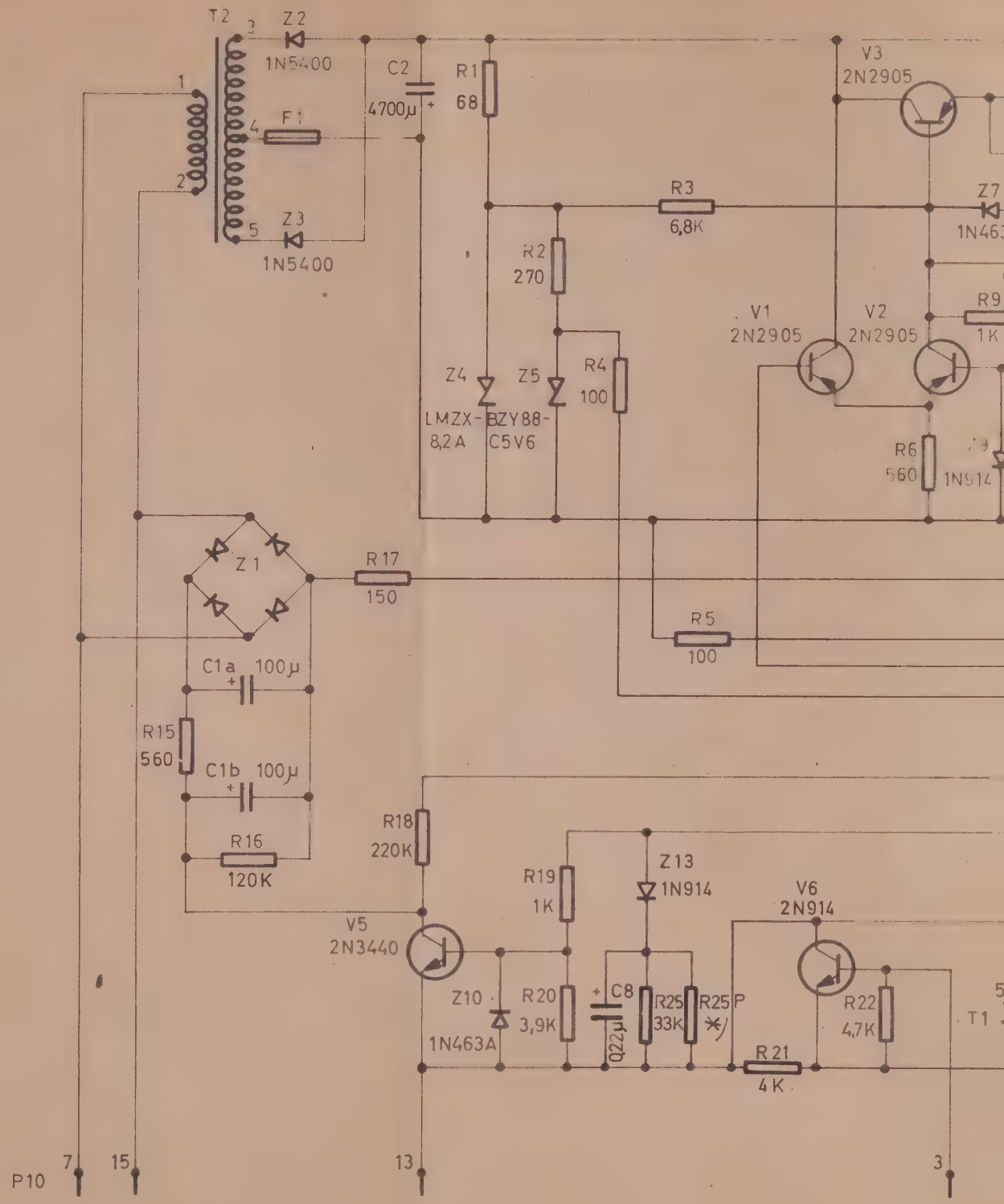
MAGNETIC AB

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
C7	Kondensator, MP Capacitor, MP	2200 pF	630 V	20%	Rifa	PME 2616/0.0022
C8	Kondensator, ker. Capacitor, cer.	1500 pF	6 kV	20%	Centralab	DD 60
C9	Kondensator, MP Capacitor, MP	0.22 µF	400 V	10%	Rifa	PME 2615/0.22
C10	Kondensator, elyt Capacitor, elyt	100+100µF	350 V		Rifa	PEH 131 UN906
F1	Säkring Fuse	20 mA	Trög Slow Blow			5 x 20 mm
	Clips 2 st				H.Schurter AG	751.0042
J12	Kontakt, koax Connector, coax.	MHV				UG-931/U
J14	Kontakt, 5 pol Connector, 5 ways				Amphenol	126-218
P6	Kontakt, 15 pol. Connector, 15 ways				Amphenol	17-90150-16
T1	Transformator Transformer				Magnetic AB	E-114260

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
V1	Transistor				Texas Instrument	2S 302
V2	Transistor				RCA	2N 3439
V3	Transistor				Delco Radio	DTS 411
V4	Transistor				RCA	2N 3439
V5	Transistor				Delco Radio	DTS 411
V6	Transistor				Delco Radio	DTS 411
Z1	Diod, zener Diode, zener					BZY 88-C9V1
Z2	Diod Diode					1N914
Z3	Diod Diode					1N914
Z4	Diod Diode				Semikron (IR)	SKEa 1/12 (A10 D10)
Z5	Diod Diode				Semikron (IR)	SKEa 1/12 (A10 D10)
Z6	Diod Diode				Semikron (IR)	SKEa 1/12 (A10 D10)
Z7	Diod Diode				Semikron (IR)	SKEa 1/12 (A10 D10)
Z8	Diod, zener Diode, zener					BZY88-C5V6
Z9	Diod Diode					1N914
Z10	Diod Diode					1N 4005

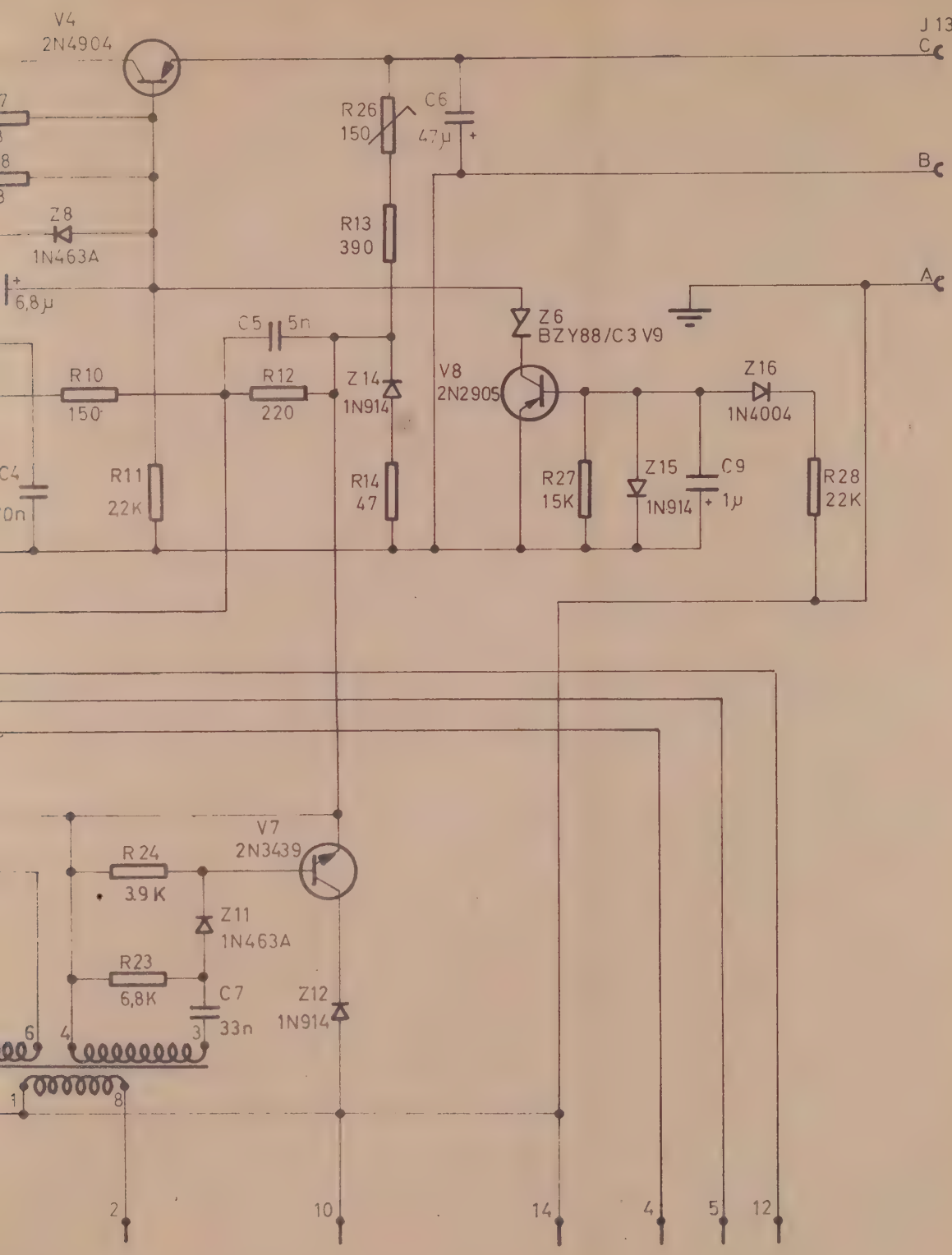
Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
Z11	Likriktare, Brygga Rectifier, Bridge				Philips (Varo)	BY 179 (VS 443)
Z12	Diod Diode					1N 914
Z13	Diod Diode					1N 914
Z14	Diod Diode					1N 463A
	1 st Kylfläns				Magnetic AB	E-7231
	4st Distans				Magnetic AB	E-211131
	2st Komponenthållare	Delas:	7+5		LME	729001/12
	3st Underlägg f. TO5		V1, V2 och V4		Jermyn	To5-001

DENNA RITNING FÖRBLIVER VÅR EGENDOM, ATT UTAN VÅRT MEDGIVANDE MÅNGFALDIGA, FÖREVISA, UTLÄMNA ELLER ELJEST OBEHÖRIGEN ANVÄNDA DENSAMMA ÄR FÖRBJUDET OCH BEIVRAS MED STÖD AV LAG AV DEN 30 MAJ 1919 SAMT LAG AV DEN 29 MAJ 1931 § 3.



*) Justeras vid fabrik
Adjusted at factory

B 31.8.71 CG
A 9.10 70



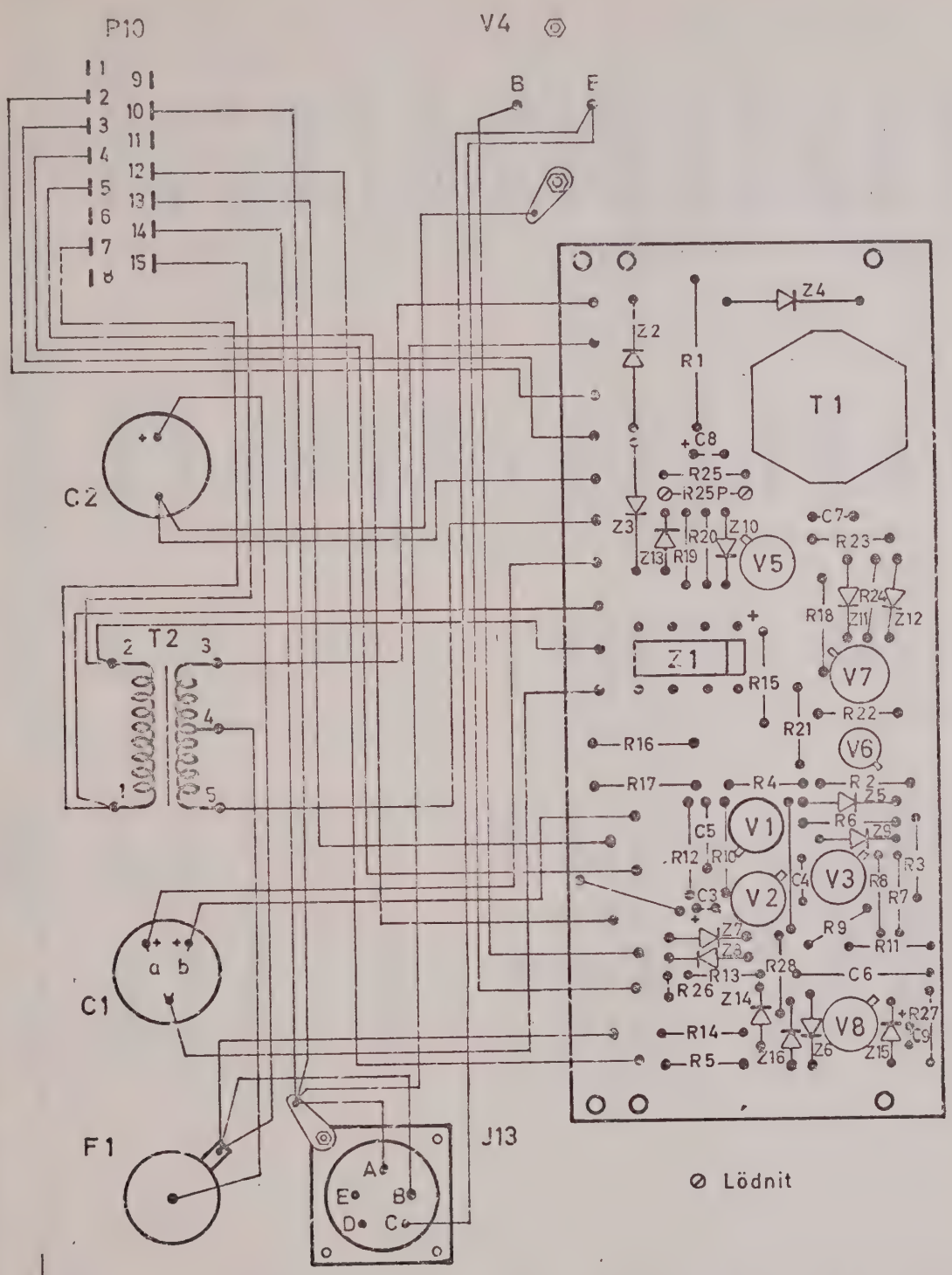
COMPONENT PLACERING :
COMPONENT LAYOUT : E-117025

Det. nr	Ant.	Benämning	Material	Anm.

Konstr	Ritad	Kap.	Kontr.	Stand.	Godk.	Skala	Ersatter	Ersatt av
	R Ö							

MAGNETIC AB Stockholm Sweden	MODULATOR 1177 Principschema	MODULATOR 1177 Circuit Diagram	Blad	Dat. nr 22 1 70
			Ritn.-nr	E-117006

DENNA RITNING FÖRBLIVER VÅR EGENDOM, ATT UTAN VÅRT MEDGIVANDE MÅNGFALDIGA, FÖREVISA, UTLÄMNA ELLER ELJEST OBEHÖRIGEN ANVÄNDA DENSAMMA ÄR FÖRBJUDET OCH BE.VRA., MED STÖD AV LAG AV DEN 30 MAJ 1919 SAMT LAG AV DEN 29 MAJ 1931 § 3.



⌀ Lödnit

B 19.71 CG	R1 monteras upphöjd från TL-kortet.
A 9.10.70	V4 monteras isolerad från gavel och förses med transistorkåpa KM 330/3

Principschema E-117006
Hålritning E-117026

Det.-nr	Ant.	Benämning	Material	Anm.

Konstr.	Ritad	Kop.	Konstr.	Stand.	Godk.	Skala	Ersätter	Ersatt av
	CG						Ritad	Den 22.1.70

MAGNETIC AB
Stockholm Sweden

MODULATOR 1177
Komponentplacering

MODULATOR 1177
Component Layout

Ritn.-nr
E-117025

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
R1	Motstånd Resistor	68 ohm	5,5 W	10 %	Philips	2322 320 31
R2	Motstånd Resistor	270 ohm	0.25 W	5 %	Kamaya	RC-1/4S
R3	Motstånd Resistor	6.8 kohm	0.25 W	5 %	Kamaya	RC-1/4S
R4	Motstånd Resistor	100 ohm	0.25 W	5 %	Kamaya	RC-1/4S
R5	Motstånd Resistor	100 ohm	0.25 W	5 %	Kamaya	RC-1/4S
R6	Motstånd Resistor	560 ohm	0.25 W	5 %	Kamaya	RC-1/4S
R7	Motstånd Resistor	18 ohm	0.25 W	5 %	Kamaya	RC-1/4S
R8	Motstånd Resistor	18 ohm	0.25 W	5 %	Kamaya	RC-1/4S
R9	Motstånd Resistor	1 kohm	0.25 W	5 %	Kamaya	RC-1/4S
R10	Motstånd Resistor	150 ohm	0.25 W	5 %	Kamaya	RC-1/4S
R11	Motstånd Resistor	2.2 kohm	0.25 W	5 %	Kamaya	RC-1/4S
R12	Motstånd Resistor	220 ohm	0.125 W	1 %	Vitrohm	CEA T2
R13	Motstånd Resistor	390 ohm	0.25 W	5 %	Kamaya	RC-1/4S
R14	Motstånd Resistor	47 ohm	0.25 W	5 %	Kamaya	RC-1/4S
R15	Motstånd Resistor	560 ohm	0.5 W	5 %	Vithrom	GBT

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
R16	Motstånd Resistor	120 kohm	0.5 W	5 %	Vitrohm	GBT
R17	Motstånd Resistor	150 ohm	0.5 W	5 %	Vitrohm	GBT
R18	Motstånd Resistor	220 kohm	0.25 W	5 %	Kamaya	RC-1/4S
R19	Motstånd Resistor	1 kohm	0.25 W	5 %	Kamaya	RC-1/4S
R20	Motstånd Resistor	3.9 kohm	0.25 W	5 %	Kamaya	RC-1/4S
R21	Motstånd Resistor	4 kohm	0.125 W	0.5 %	Vitrohm	CEA T0
R22	Motstånd Resistor	4.7 kohm	0.25 W	5 %	Kamaya	RC-1/4S
R23	Motstånd Resistor	6.8 kohm	0.25 W	5 %	Kamaya	RC-1/4S
R24	Motstånd Resistor	3.9 kohm	0.25 W	5 %	Kamaya	RC-1/4S
R25	Motstånd Resistor	33 k	0.25 W	5 %	Kamaya	RC-1/4S
R26	Motstånd, NTC Resistor	150 ohm	0.6 W		Philips	2322 642 11151
R27	Motstånd Resistor	15 kohm	0.25 W	5 %	Kamaya	RC-1/4S
R28	Motstånd Resistor	22 kohm	0.25 W	5 %	Kamaya	RC-1/4S

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
C1	Kondensator, elyt Capacitor, elyt	100+100uF	350 V		Rifa	PEH 131 UN906
C2	Kondensator, elyt Capacitor, elyt	4700 uF	25 V		Rifa	PEH 131 HC 447
C3	Kondensator, tantal Capacitor, tantalum	6.8 uF	16 V		ITT	TAG 6.8/16
C4	Kondensator, ker. Capacitor, cer.	0.01 uF	350 V		Erie	811
C5	Kondensator, ker. Capacitor, cer.	0.005 uF	500 V		Erie	811
C6	Kondensator, elyt Capacitor, elyt	47 uF	16 V		Rifa	PEG 112 GA 247
C7	Kondensator, ker. Capacitor, cer.	0.033 uF	18 V		Erie	831
C8	Kondensator, tantal Capacitor, tantalum	0.22 uF	35 V		ITT	TAG 0.22/35
C9	Kondensator, tantal Capacitor, tantalum	1 uF	35 V		ITT	TAG 1/35
F1	Säkringshållare Fuse holder				H.Schurter AG	FEP 031.1001
	Säkring Fuse	2A	Trög Slow blow			5 x 20 mm
J13	Kontakt, 5 pol Connector, 5 ways					MS 3102A-14s-5s
P10	Kontakt, 15 pol. Connector, 15 ways				Amphenol	17-90150-16

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Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
T1	Transformator Transformer				Magnetic AB	E-117072
T2	Transformator Transformer				Elab	35150
V1	Transistor					2N 2905
V2	Transistor					2N 2905
V3	Transistor					2N 2905
V4	Transistor				Motorola	2N 4904
V5	Transistor				RCA	2N 3440
V6	Transistor					2N 914
V7	Transistor				RCA	2N 3439
V8	Transistor					2N 2905
Z1	Likriktare, brygga Rectifier, bridge				Philips (Varo)	BY 179 (VS 448)
Z2	Diod Diode				Westinghouse	1N 5400
Z3	Diod Diode				Westinghouse	1N 5400
Z4	Diod, zener Diode, zener				Semcor	LMZX-8.2A
Z5	Diod, zener Diode, zener					BZY88/C5V6
Z6	Diod, zener Diode, zener					BZY88/C3V9
Z7	Diod Diode					1N 463A
Z8	Diod Diode					1N 463A

Pos. Nr Pos. No.	Komponentbeskrivning Description	Värde Value	Effekt Arb. sp. Rating	Tolerans Tolerance	Tillverkare Manufacturer	Typ Nr Part No.
Z9	Diod Diode					1N914
Z10	Diod Diode					1N 463A
Z11	Diod Diode					1N 463A
Z12	Diod Diode					1N 914
Z13	Diod Diode					1N 914
Z14	Diod Diode					1N 914
Z15	Diod Diode					1N 914
Z16	Diod Diode					1N 4004
	Transistorkåpa				Syphert Electro-nics	KM 330/3
	6 st Underlägg T05	(V1-V3,V5,V7,V8)			Jermyn	T05-001
	1 st Underlägg T018	(V6)			Jermyn	T018-002

ORDERING REPLACEMENT PARTS

When ordering replacement parts, please specify the following information to assure your getting the right part in the shortest possible time.

1. A complete description of the part, e.g. resistance, tolerance, wattage, capacitance, voltage, etc.

2. Instrument model number and serial number.

3. Component designation, e.g. C 34, in parts list or circuit diagram.

Should, for some reason, this information be unknown, please describe the component as accurate as possible, its function and location in the equipment.

The component delivered as a replacement part may not be exactly like the one mounted originally in the equipment, as our purchasing department buys from at least two different vendors. The manufacturer of the original component may also have improved his product and thereby changed the dimensions. However, the component will work in the instrument it is intended for.

Guarantee

We guarantee to repair or replace free of charge any of the goods, other than consumable material such as semiconductors valves, lamps and fuses, found to our satisfaction within 12 months after the date of delivery, to be defective owing to faulty workmanship or materials, provided that in the case of goods or component not of our manufacture our liability under this condition is in no circumstances to extend beyond any corresponding liability to us of our supplier.

Any claims must be made within the period of guarantee. We reserve the right to decide what actions shall be taken in case of repair or replacement of parts according to this clause. Under no circumstances shall goods be returned without our consent.

This guarantee does not cover the repair or replacement of any part or parts which fail due to mistakes on the part of operating personnel or of operation of the equipment in a way other than laid down in the operating instructions, or due to fair wear and tear or any other causes not covered by the above guarantee.

RETURN PROCEDURE:

Do not return goods without our written consent. A letter stating the claim should be sent to MAGNETIC AB, Manufacturing Division, Box 110 60 S-161 11, Bromma 11, Sweden. The failure must be clearly specified and model and serial number, of the equipment should be carefully noted.

MP MASTER
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